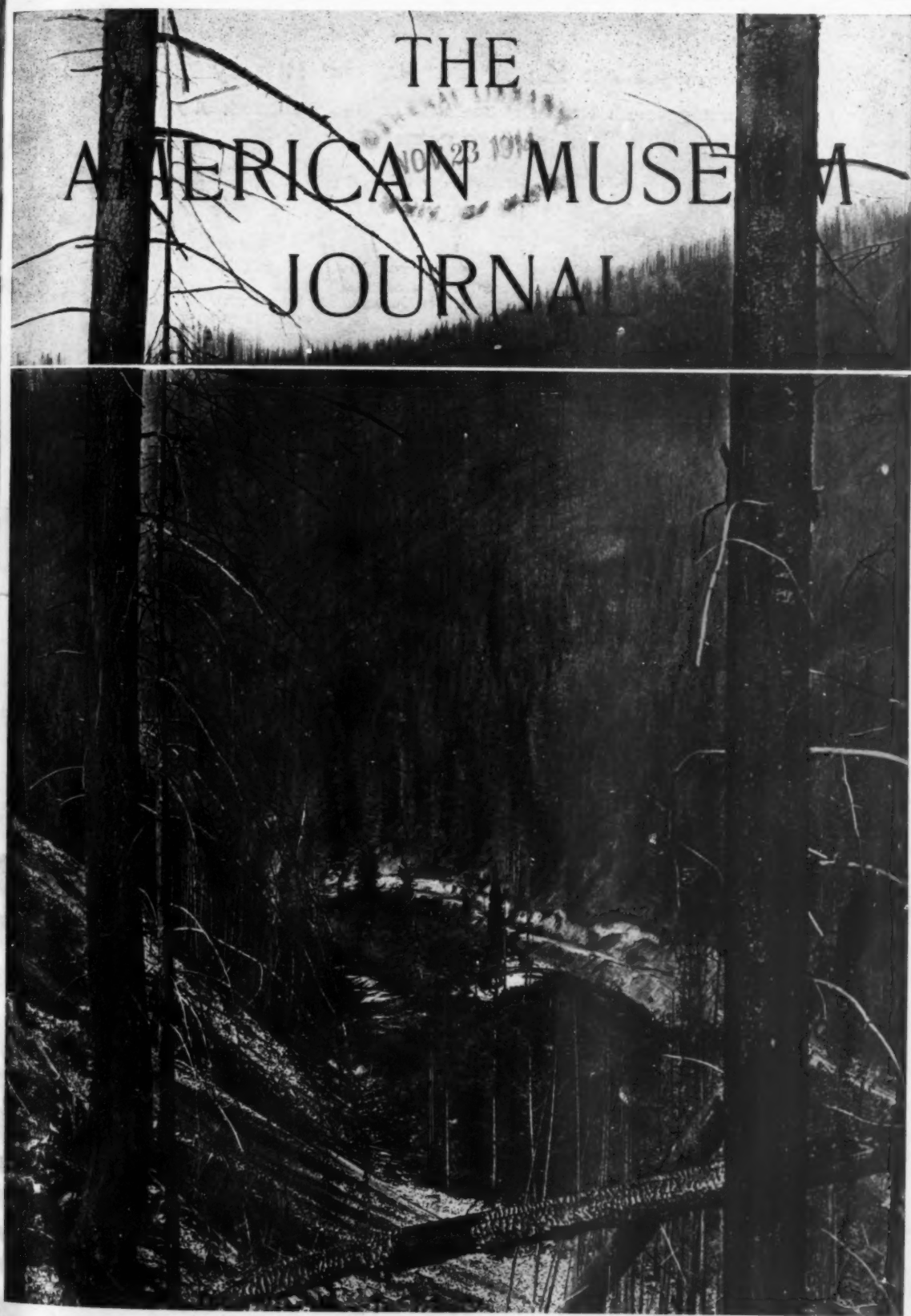


VOLUME XIV

OCTOBER-NOVEMBER, 1914

NUMBER 6-7



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# THE AMERICAN MUSEUM JOURNAL

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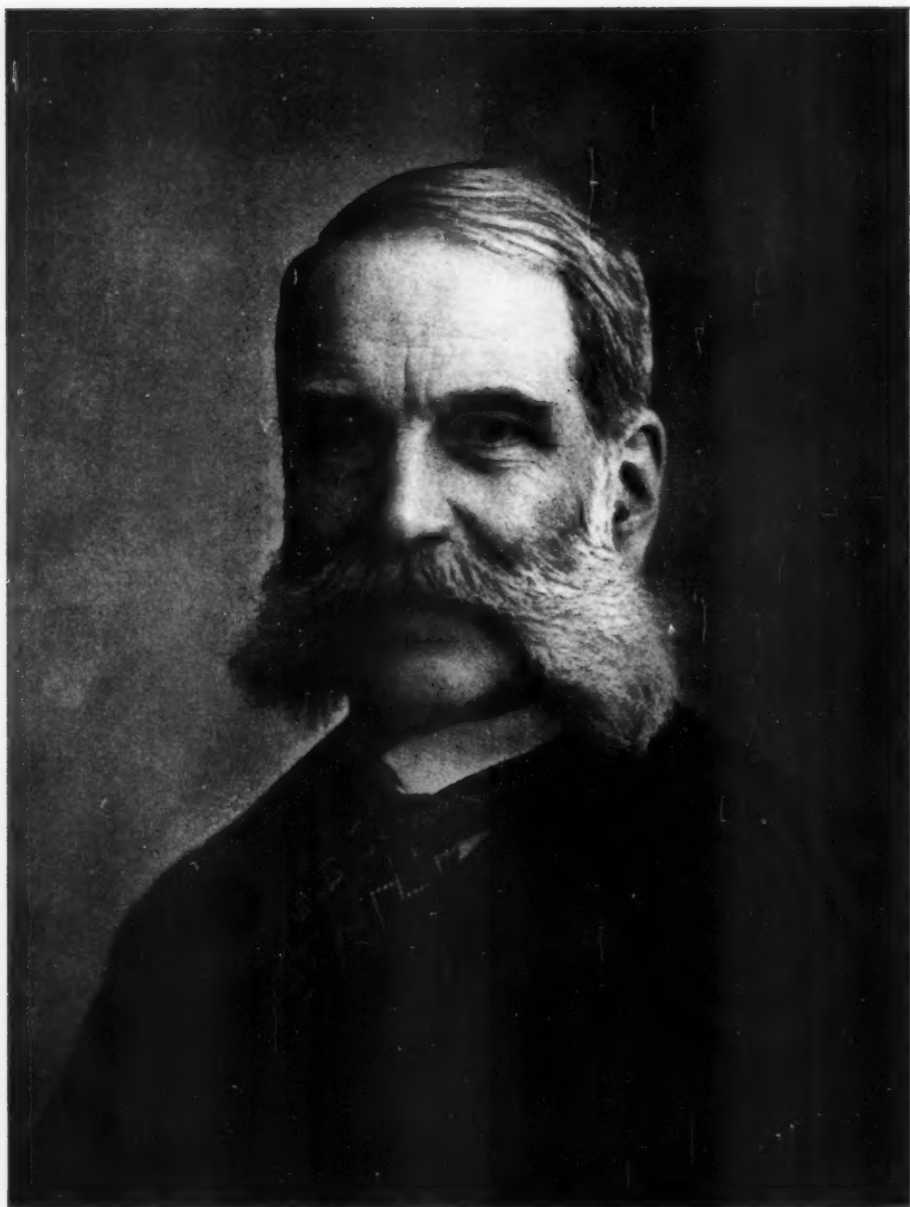
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MARY CYNTHIA DICKERSON, *Editor*

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THE LATE MORRIS K. JESUP, PRESIDENT OF THE AMERICAN MUSEUM OF NATURAL HISTORY 1881 TO 1908, FROM WHOSE ESTATE HAS RECENTLY COME TO THIS MUSEUM OF THE AMERICAN PEOPLE A BEQUEST OF FIVE MILLION DOLLARS



# THE AMERICAN MUSEUM JOURNAL

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## THE MUSEUM OF THE AMERICAN PEOPLE

THE MORRIS K. JESUP ENDOWMENT FUND OF FIVE MILLION DOLLARS, A RECENT BEQUEST OF MRS. JESUP, RESTRICTED TO EDUCATIONAL AND SCIENTIFIC WORK.—MAINTENANCE AND BUILDING OF THE INSTITUTION STILL IN THE HANDS OF THE CITIZENS OF NEW YORK CITY ACCORDING TO THE ORIGINAL PURPOSE OF FOUNDATION

By Henry Fairfield Osborn

THE Morris K. Jesup Endowment Fund, which comes to the Museum through the bequest of Mrs. Jesup, marks another turning point in the history of the institution, and places the educational and scientific work on a firm foundation for all future time. In amount this is the largest gift which has ever been made to scientific education in the great City of New York, and if administered, as it will be, in an intelligent and patriotic spirit, it will doubtless exert a lasting influence upon the people not only of this municipality, but also of the entire country and even upon the peoples of all other countries.

The American Museum has long ceased to be a civic institution and like its noble sister, the National Museum of Washington, has outgrown the bounds even of a national institution through close coöperation and cordial relations with similar organizations in all parts of the world. The Jesup Fund will strengthen and extend this spirit of enlightenment around the globe. Recalling the broad purpose of Mr. Jesup's administration, we wish it were possible for him to witness the results which will flow from his benefaction.

This endowment has been welcomed by our own Museum and by all other

institutions of the country because of the example and the standard set to public-spirited citizens in other municipalities.

A very wise restriction which surrounded Mr. Jesup's original bequest and which also obtains in this, is that *no part of the interest shall be used for maintenance or for building*. Mr. Jesup intended that the responsibility for the upkeep and construction of the Museum should rest upon the people of the City of New York, according to the original purpose of its foundation. He desired it always to remain a public institution—one which the people of our great municipality can feel is in part their own, because they build and maintain it.

This, we believe, is an expression of the finest civic judgment. Indeed, the men who become known as great citizens through their personality or through their generosity, should not assume the duties and responsibilities of all citizenship. This is not the true American spirit and it is not the spirit which animates an institution rightly known as "American."

It is necessary to lay emphasis upon this important feature of our charter at the present time. We believe that the people of the City of New York have learned to love the Museum and to feel

the inestimable advantages which it extends to all and particularly to the young, and we also believe that the people are willing to do their share in maintaining and in extending the building, in order to make it possible to reap the benefits of this munificent fund.

In the death of Mrs. Morris K. Jesup on June 17, 1914, the Museum lost another member of the original and distinguished circle of its founders, for through her very close association with Mr. Jesup's interests and ambitions during his lifetime, and her constant sympathy in, and support of, all his plans and undertakings, we may always recall Mrs. Jesup's name with that of her husband. Her personal concern in the welfare of the Museum was not lessened but rather deepened after Mr. Jesup's death, because it was her earnest desire to represent and continue his interests, and her judgment and her gifts were always guided by what she believed he would have wished her to do. Her visits to the Museum were full of association with his plans, and after the lapse of a few years became a source of increased delight.

Mrs. Jesup's interest in the Museum, like that of her husband, was so broad that it extended to practically all departments. One evidence of this is the character and variety of her gifts to the institution. Among her early gifts was a large mass of pink tourmaline from San Diego, California, which enriched the collections of the department of mineralogy. Through her generosity the department of anthropology received a large collection of ethnological material from the Arapaho. She also presented an important series of specimens illustrating the industries, ceremonials and

art of the Shoshone, Bannock, Ute and Kootenai Indians and later ethnological collections from the Gros Ventre, Assiniboine, Crow and Sioux. The department of vertebrate palaeontology is indebted to Mrs. Jesup for a skeleton of *Tyrannosaurus*, a skull of *Triceratops* and other remains of dinosaurs of the Upper Cretaceous beds of Montana. She also gave funds through which were obtained skulls and skeletons of *Diadactes*, *Pariotichus*, *Dimetrodon* and other primitive reptiles and amphibians of the Permian of Texas. The departments of invertebrate zoölogy and of mammalogy and ornithology were enriched by the collections that were secured through her generosity.

Perhaps the most important of her gifts were the three Cape York meteorites — "Ahnighito," "Dog," and "Woman," presented to the Museum in 1908. These meteorites were brought from Cape York by Admiral Peary. "Ahnighito" is the largest known meteorite in the world, weighing thirty-six and one-half tons.

In 1913 Mrs. Jesup offered to contribute \$25,000, one-half of the sum needed, to equip the second Stefánsson expedition, but as Mr. Stefánsson's work was taken up by the Canadian Government, Mrs. Jesup was never called upon to make this contribution.

The pleasure which a great bequest gives to all the friends of the institution is shadowed by a feeling of sorrow when it comes with the loss of such a noble-hearted woman. It is true that Mrs. Jesup's name will endure in association with her many individual gifts, but we hope that the Trustees may find a way of perpetuating her memory in connection with some special exhibition or collection.

SERIES OF PHOTOGRAPHS  
SUGGESTIVE OF THE PRO-  
GRESSIVE POLICY OF OUR  
NATIONAL AND STATE  
GOVERNMENTS IN REGARD  
TO FOREST CONSERVATION

PLATES REPRODUCED THROUGH  
THE COURTESY OF THE AMERI-  
CAN FORESTRY ASSOCIATION  
AND THE NEW YORK STATE  
FORESTRY ASSOCIATION :::::



### IN THE COAST FOREST OF BRITISH COLUMBIA

Such balsam and hemlock forests with trees two hundred feet high may average more than 100,000 board feet to the acre and are attractive investments for paper pulp. We must realize that trees of this size will probably never reappear on the cut-over land under any system of federal or state reforestation and protection, for the commercial demand will always be so great that trees of smaller size must satisfy it



### PRIMEVAL FOREST IN NORTH CAROLINA

In the Appalachians and White Mountains more than 1,100,000 acres have been acquired for national forest purposes. The various states concerned are in coöperation with the national government in giving fire protection to the forested watersheds commanded by these lands, and federal management will aim to increase productivity in timber, grazing and other forest resources





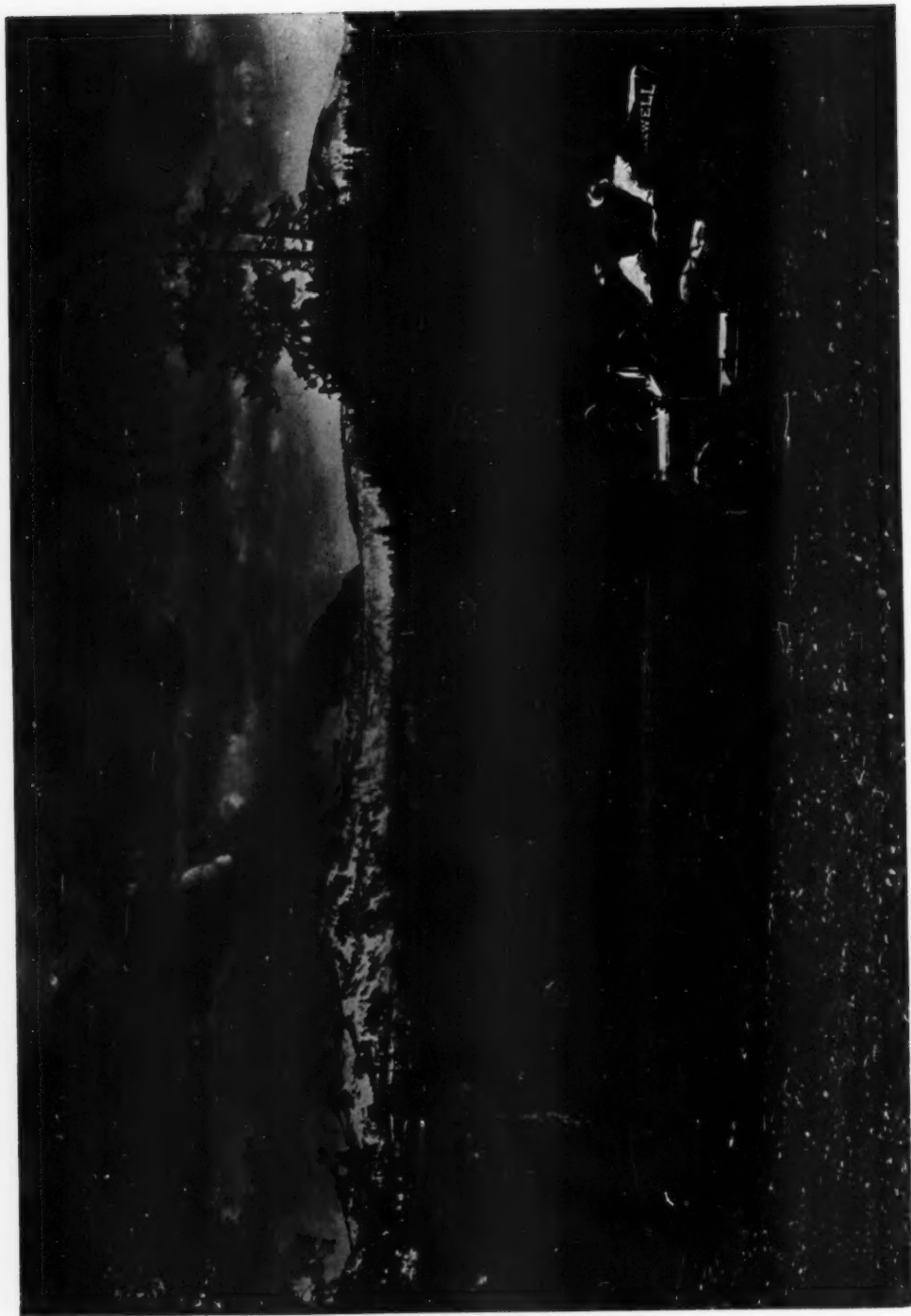
### TROUT STREAM IN PISGAH FOREST, SOUTHERN APPALACHIANS

Pisgah Forest (86,700 acres), developed for twenty-five years by the late George W. Vanderbilt until it became one of the finest forest properties in the country, has now come into the possession of the government and will remain an object lesson for Americans. It has had protection not only from fire but also from destructive lumbering. Mr. Vanderbilt believed private ownership a public trust and that no man was a good citizen who destroyed a growing forest for selfish ends.



### MOUNT JEFFERSON, CASCADE NATIONAL FOREST, OREGON

Surrounding Mount Jefferson are many square miles of unbroken forest cover, for the watersheds of streams. It is easy to understand how such forested land forms a "sponge" to retain and send down slowly throughout the summer the water from spring rains and from the melting snows of higher land. It is easy to understand also the cause of the spring floods and summer droughts when such forests are destroyed by fire or the lumberman and these rains and melting snows are permitted to rush unchecked down the steep slopes



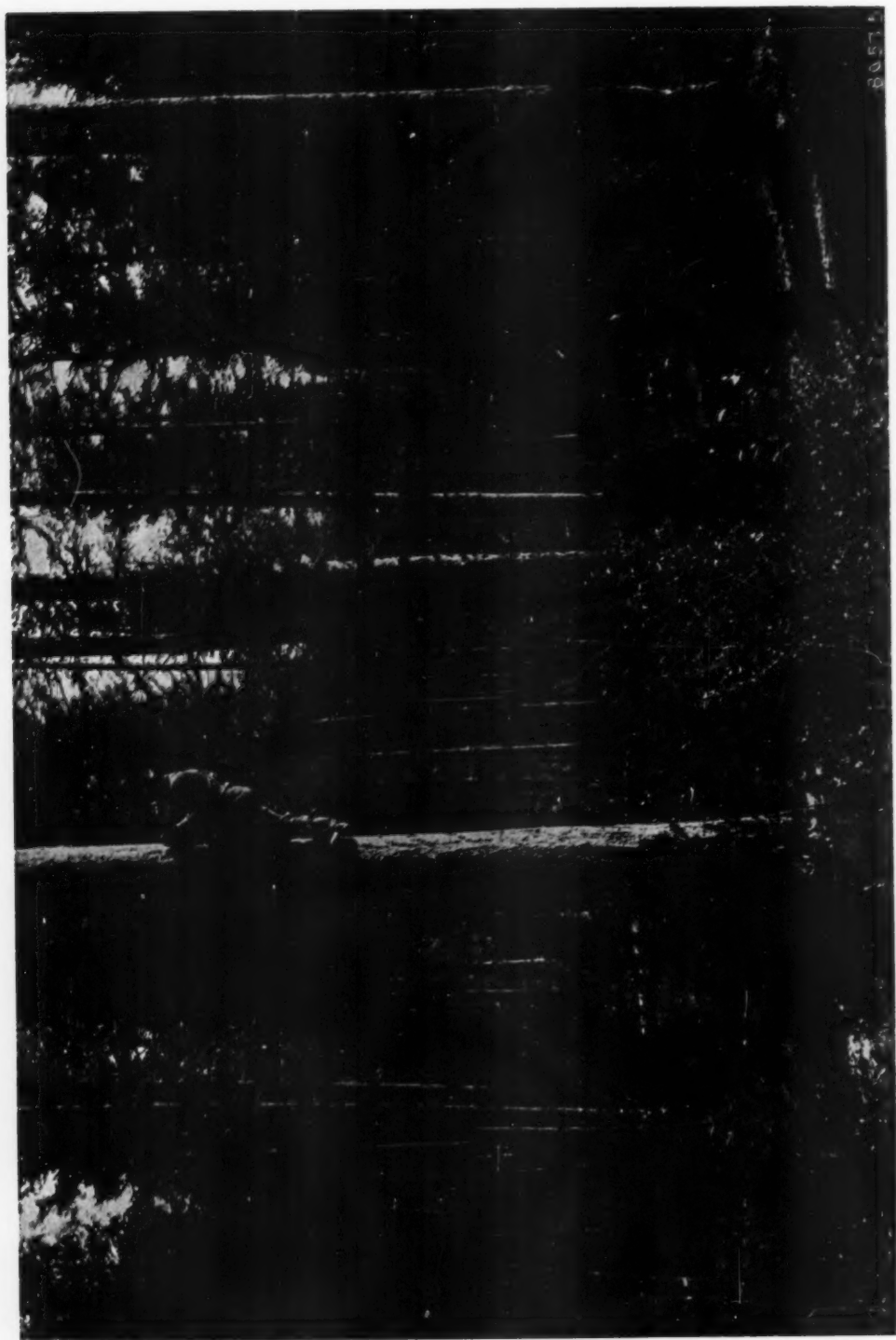
### RECENT ERUPTION OF MOUNT LASSEN, CALIFORNIA

The Forest Service lookout on Mount Lassen, California, in Lassen National Forest, commanding a view of the surrounding hills for the purpose of fire prevention, was destroyed in the eruption of June 12, 1914. A new lookout station is being located on Brokeoff Mountain, a few miles distant from Mount Lassen.



### FIRE HAVOC ON BITTER ROOT MOUNTAIN, IDAHO

If ground fire gains a start during a time of heavy wind, it is likely to spread to the tree-tops and cause great loss of life and homes as well as of forest property. There is no way to fight such a fire except to start a second fire back to meet the main fire so that both will die out for lack of fuel. Government care of forests aims to prevent fires from obtaining such destructive proportions



### TELEPHONE CONNECTION IN FLATHEAD NATIONAL FOREST, MONTANA

The government forest ranger (appointed through competitive examination in the Civil Service) guards on the average 168 square miles, or more than 100,000 acres. He keeps a lookout for fire, cuts trails, builds bridges and installs telephone lines connecting his lookout with near towns in case help is needed in putting out fires. He also gathers hundreds of bushels of seeds, prepares land for nurseries and raises and transplants young trees. He must also enforce game laws and protect those holding permits for grazing or other use of the forest.





Seed collecting camp in a Rocky Mountain national forest. Note the sacks of cones, and the cones spread on canvas sheets to dry



Planting western yellow pine in Pike National Forest. Pike's Peak (14,000 feet high) commands watersheds of great economic importance. Some fifty years ago, in the days of the early white settlers of the region, 10,000 acres of the forest cover were wholly destroyed by fire. The Forest Service is now reforesting the watersheds that supply water to Colorado Springs, Colorado City and other important districts



### SHEEP RANCH IN THE COLORADO NATIONAL FOREST

In the West the government acts as a public service corporation to the live stock industry on which the country depends. The stock growers, who are now almost without exception resident ranch-owners, cooperate with the Forest Service in its general progressive policy, especially in improvement of forage conditions and prevention of fire



Area too rough for domestic animals, given over to mountain sheep, Mount Evans, Pike National Forest. Coöperation between State Game Departments and the National Biological Survey is placing game upon suitable unoccupied ranges. Two hundred elk were thus placed in 1913



Summer camp in Crater National Forest, Oregon, under special use permit. National and state forests are great public playgrounds open to all who enjoy camping in a country of beautiful scenery and good sport



### A VIRGIN STAND IN THE ADIRONDACKS

The 1,800,000 acres owned by the state could serve as a playground for all New England and New York, if camp sites could be leased. If the ripe timber could be cut, a splendid revenue could be derived. [Quoted from the *Bulletin of the New York State Forestry Association* for June, 1914]

## FORESTRY IN THE STATE OF NEW YORK

By Mary Cynthia Dickerson

**INTRODUCTORY NOTE:** It chanced that the American Museum, for the main part zoölogical and anthropological, has a practical interest in the forests of North America and their conservation. This interest is founded on the fact that some thirty years ago, in the pioneer days of the forestry movement, the former president of the American Museum, Morris K. Jesup, created here a department of woods and forestry and installed the greatest collection of tree specimens in the world, the Jesup Collection of North American Woods.

We are to-day reminded of Mr. Jesup's interest in forestry, not alone by Mrs. Jesup's recent bequest to the Museum which calls to mind all of her husband's long devotion to the institution, but also emphatically by the present condition of forestry in the state. If the forest reserves of to-day had existed in Mr. Jesup's time, he would have been filled with rejoicing at so great a consummation of his desires. He urged that various forested lands be set aside as state forests, especially certain areas in the Adirondacks controlling the watershed of the Hudson. His words are on record: "A wise and comprehensive state policy will seize upon the whole forest region [known as the Adirondack Wilderness] and keep it for all time as a great forest preserve and in this way insure abundant water to the Hudson..." Mr. Jesup strove for this. He argued the matter before the Chamber of Commerce (1883) and even went to Albany and made personal appeal before a special committee of the Senate. He explained how forests store up rainfall, keeping it from evaporation and particularly the melting snows of high mountain ridges, and thus provide constant and equal water supply to the rivers which have their sources in the region. As a result of the campaign that he inaugurated, a law was passed creating an Adirondack preserve (1885).

"**F**ORESTRY in the state of New York is flourishing everywhere except in the woods," was Gifford Pinchot's introduction to an address on the Adirondack forests before the Camp Fire Club of America in 1911. This introduction was followed by an onslaught of facts in which non-use of the state's holdings in the Adirondack region combined with fires on these holdings, and bad logging and needless destruction combined with fires on the holdings in the hands of lumber companies and private individuals made out a very poor showing for New York. In the three years since that time there has been definite improvement, yet the condition of forestry in the state has been unusual from the first and has truly flourished more in clubs, associations, commissions and even in legislatures than "in the woods."

More than 1,800,000 acres of land constitute the forest reserves of New

York State to-day.<sup>1</sup> This is more than any other state has set aside, Pennsylvania of pioneer interest and largely responsible for the movement in other states, coming nearest with 983,529 acres.

Notwithstanding the satisfaction<sup>2</sup> to be felt at this relatively large acquisition of state lands, a vigorous campaign has recently been waged and is still in progress to bring about various changes in the laws of the state, for the greatest hindrance immediately in the way of progress is a matter of legislation. In 1894 laws were passed prohibiting all direct use of the state reserves. The Constitution reads as follows (Section 7 of Article 7): "The lands of the state, now owned or hereafter acquired, constituting the forest preserve as now fixed by law, shall be forever kept as wild forest lands. They shall not be leased, sold

<sup>1</sup> 1,825,833 acres, in 6,850 parcels. Report of the New York Conservation Commission, January 1, 1914.



or exchanged, or be taken by any corporation, public or private, nor shall the timber be sold, removed or destroyed."

The people cannot lease camp sites in the forests or fish from the streams, whereas these state forests should constitute playgrounds for the people as do the national forests, under special permits. All cutting of timber is forbidden. Such prohibition was no doubt wise in 1894 when past wastefulness and misuse needed a sharp lesson, in order to save the remaining forests for important watersheds, and when forestry was a rather vague thing and understood itself less well than in 1914.

Now our national forests have pursued for a period of seven years the policy of utilization, of course under the control of trained foresters, and the policy has been proved wise, as it had been proved previously in Europe. Over-mature timber should be cut, for the sake of the younger timber and for the prevention of fire, to say nothing of the matter of revenue, and this cutting does not detract from the permanent value of the forest but enhances it instead.

Besides in the twenty years between 1894 and 1914 New York State has undergone important economic changes. There are three million people added to the six millions then in the state, crowded into the same cities, demanding food as well as wood and other materials for industries from the same area as then. While there has been this increase in the ratio of population, there has been a decrease in the ratio of wood-producing lands, by the very creation of a larger forest reserve, because of forest fires and particularly because of the continued marketing of crops from private and corporation-owned forests without provision for new growth of timber to take the place of these crops.

To-day if it were not for the constitutional prohibition, utilization from state lands of just overgrown and dead timber (for trees are like all other living things in that they reach maturity and die), without injuring the forests either in their present protection of river sources or in their future timber supply, could give to the state a revenue of at least one million dollars annually. This would help to counterbalance the twenty to thirty million dollars sent out of the state every year for wood to use in industries.

There has been in recent years notwithstanding, considerable legislation in New York regarding forestry matters. Each year the state has made various appropriations for fire prevention and reforestation, sums that seem large until viewed in relation to the magnitude of the work to be done. There are laws enjoining stringent penalties for the negligent starting of fires. Since 1909 as a matter of fire prevention, lumbermen have been obliged to lop the branches from discarded tops of trees so that they will all lie close to the ground and decay quickly.

There has been legislation (1912) especially intended for private owners who wish to grow trees. New York and Michigan are progressive beyond all other states in regard to taxation in such cases, the land being exempt or taxed at a low rate, the crop taxed only when cut.

In 1913 an amendment to the constitution authorized the state to use its forest preserves (in amount not to exceed three per cent) for the development of water power and the establishment of a storage reservoir in the Adirondacks.

Finally there seems now to be in sight for 1915, legislation touching the crucial points of the prohibition. In January, 1914, a resolution was passed amending Section 7 of Article 7 of the constitution to allow the removal of mature and dead timber from the reserves, as well as to

permit leasing of camp sites. Like all constitutional amendments however, it must be brought before a second legislature and then run the gauntlet of the people's vote before it can become active law.<sup>1</sup> The proposed amendment has received large attention within the state and without. If the prohibition should be removed and the state be given control of the management of its forests on the principles of scientific reforestation, culture and cutting, such as is adding to the economic advancement of our national forests, New York State will undoubtedly be assured a steadily increasing prosperity for the future.

The state situation is one that calls for much constructive work with large appropriations to carry it through, and the work will later yield sustained financial and other profitable returns just in proportion to the amounts expended in this preliminary preparation. New York used to be a great lumber-producing state. It was the greatest in the nation in 1850. It has now dropped to twenty-fourth rank. On the other hand New York is at present the greatest wood-consuming state in the Union, requiring approximately two billion board feet every year in the wood-using industries. It is thus easy to understand that we must annually send outside of the state for something approaching thirty mil-

lion dollars' worth of lumber — for Douglas fir, western cedar and redwood from across the whole breadth of the continent; for yellow pine and southern cypress from the Gulf States.

The point is that New York can be made self-supporting in its wood industries. No state in the Union is more advantageously equipped for profitable lumber production, in climate, rainfall, soil, facilities for marketing and amount of lands more suitable for tree crops than for agriculture. The estimate is that from twelve million to fourteen million acres in New York (seven millions of which are idle lands on the farms of the state) can eventually be given over to forest growth because not suitable for other purposes, while experts personally experienced in the study of the forests of Europe maintain that fifty years of the right care ought to make many of our forests, the Adirondack region for instance, compare favorably or even surpass the Black Forest or any of the famous forests abroad.

With these facts in mind and with the knowledge that to-day in our state reserves even, immense areas are wholly cut over or burned and others are covered sparsely with trees of little value, review the situation in the state. Look ahead at what can and should be. Look at the present condition. Surely we are at the very beginning of the work, with little done except tree planting in relatively small amount, only enough to serve well as guide in future work, even though greater than has been done by any other state, and in addition a considerably increased protection of our forests from fire — although here only of the state forests for there is no state-wide fire law. Something over fifty observation towers have been built in the Adirondack and Catskill regions, on mountain heights from which the country through a radius

<sup>1</sup> This will mean that the amendment must pass a majority vote of the new legislature of January 1915 and then be adopted or rejected by the people's vote in the fall of 1915, if adopted becoming active law the following January. It chances however that this fall sees the election of delegates to a constitutional convention to meet next May — since the original constitution of New York State provides that a convention shall be elected at least once in twenty years for a re-drafting of constitutional law and the last such convention met in 1894. Thus it is a dramatic moment for forestry interests in that they can work for an active law allowing use of state lands and giving state-wide fire protection through two bodies, the regular legislature of 1915 and the constitutional convention, the latter like the former having power to pass a constitutional amendment directly to the people's vote if it so desires.

of twenty miles can be seen by the aid of field glasses. The necessary telephone connections have been made between the lookouts and neighboring villages. This system gives the right kind of protection but must be greatly extended before the state will be freed from forest fires.

We are at the beginning of work which promises prosperity yet can scarcely set out on it for lack of the support of an ardent and united public sentiment throughout the state. The most important step toward obtaining this was taken somewhat over a year ago when the New York State Forestry Association was organized. This aims to co-ordinate all the forestry interests of the state, having on its executive committee representatives from each of the other organizations interested in particular aspects of the forestry question. It can speak of forestry authoritatively to the people and can stand authoritatively on forest problems between the people and legislative bodies.

Another important step in advance was the creation of a state school for education in forestry with Dr. Hugh P. Baker, formerly of the Pennsylvania State College, at its head. This is known as the New York State College of Forestry and is in connection with Syracuse University. It is already making its influence felt not only in technical and practical forestry in forest camps and laboratory but also in lecture and exhibition work before all sorts of organizations and on all sorts of occasions. It is also taking active measures to further forestry teaching in the schools, hoping to reach the interest of parents through the children. Thus it may be that if this amalgamation of forestry interests and widespread education continue, a very few years will see New York State well started toward the great future the forestry prophets predict.

To reach this future the state will extend its system of fire prevention to all the forests within its boundaries. Our state reserves will be increased by a still greater acreage, since forestry interests must perforce remain in the hands of the government, the length of time before a crop can be financially realized on and the passing instead of permanent interest of the individual owner precluding any great amount of private forestry practice — even though the crop be exempt from taxation during the period of growth.

To reach this golden future the state's holdings will be kept outside of the influence of politics and commercialism and the management will be in accordance with the judgment of the state's trained foresters. Steady progress will be made year after year in planting or naturally reforesting denuded areas until all mountain sides to timber line, all hillsides, all lands in any situation incapable of producing agricultural crops of good quality, will be covered with deep forest. Wise systems of reforestation will give also the varieties of wood best adapted for our definite industries, and scientific care may possibly so increase rapidity of growth that many of our cherished kinds of wood which we thought barred to us for the future because of their slow growth may be made to reach maturity in a fraction of the time required by nature's methods unaided. Conservative systems of cutting will yield state revenues year after year from marketing ripe timber, while there will still remain for to-day and for the future these same state forests, always unimpaired in their control of water supply and in their almost unrivaled beauty, as recreation places for those who are obliged to spend the greater number of their days in cities.

# PALÆOLITHIC ART AS REPRESENTED IN THE COLLECTIONS OF THE AMERICAN MUSEUM OF NATURAL HISTORY

By George Grant MacCurdy

THE specimens that form the basis for this paper were collected during the summer of 1912 by Professor Henry Fairfield Osborn, president of the American Museum of Natural History, and myself.<sup>1</sup> They are of



Crenate flint scrapers from the Abri Blanchard (Dordogne), Middle Aurignacian Epoch. These and many other specimens obtained by the American Museum in 1912 are representative types of Aurignacian industrial remains similar to the original specimens found in 1863 in the cave of Aurignac and now in nearly all excavations of European caves and recognized as showing Aurignacian culture

<sup>1</sup> A map of southwestern Europe showing the principal cavern regions is to be found in the December, 1912, *JOURNAL* (opp. page 280). The map accompanies an article descriptive of the motor journey taken by Professor Osborn and Professor MacCurdy to European palæolithic caverns in 1912 when many valuable specimens were obtained to fill gaps in the American Museum series. The January, 1913, *JOURNAL* contains a previous article by Professor MacCurdy on "Cultural Proof of Man's Antiquity."

especial importance because of their bearing on the technology and art of the upper palæolithic period, and were selected with the especial object of filling



Bone points from the Abri Blanchard, Middle Aurignacian Epoch. The flint industry was at a high stage in the Aurignacian Epoch and later declined as the making of implements and ornaments of bone increased

serious gaps in the Museum series. Of the three great art epochs, Aurignacian, Solutréan, and Magdalenian, we were fortunate in securing an original engraving from two — the first and the last. Objects of personal adornment and industrial remains, especially type specimens, were also collected.

The chief interest however centers in the two engravings, because of the policy of the French Government to reserve for itself everything in the line of palæolithic art; and in this respect the Government has the support of public sentiment. This spirit is not only easily understood, but also highly commendable in view of the world-wide interest that attaches to the subject of Quaternary art. Old masters come high; why not also the oldest masters? Each new find is reported immediately to the Paris Academy of Sciences. Some half-dozen Aurignacian engravings on mammoth bone and on pebbles found on October 3, 1913, in the rock-shelter of La Colombière, valley of the Ain, about thirty miles southwest of Geneva, were presented before the Paris Academy on October 20, and early in November full details of the find with illustrations were republished in New York City. The discovery at La Colombière created unusual interest because in two instances the human form was represented.

The names of the palæolithic culture stages are now almost as familiar to the general reader as are those of the geologic epochs. Gabriel de Mortillet had more to do than any other one man with building up and popularizing this system of classification. To him however, does not belong the credit for introducing into the system the term "Aurignacian" and for placing it where it belongs, viz., between the Mousterian and Solutréan epochs; although at one time he was inclined to differentiate an additional



epoch and call it the Aurignacian. He at first followed the lead of Lartet, the explorer of Aurignac, and placed the Aurignacian where it rightly belongs, but later placed it between the Solutréan and Magdalenian, and finally dropped it altogether from his classification. Forty years ago Edouard Dupont of Brussels felt the need of an epoch not at that time provided for, which would include the culture stages represented in the caves of Montaigne and La Hastière (Belgium) — namely, stages that are now known to be Aurignacian. It was however reserved for the Abbé H. Breuil, ably seconded by Cartailhac and Rutot, to differentiate and firmly establish this culture. The name Aurignacian was well chosen because it was from the cave of Aurignac (Haute-Garonne), that industrial remains of the type in question were first reported [by Lartet in 1863].

Now one scarcely opens a cave in Europe without encountering Aurignacian deposits. Much of the palæolithic mural art is likewise of Aurignacian age, proving the latter to have been the first great Quaternary art epoch. Then sculpture in the round and high relief flourished as they perhaps never did again, and the arts of engraving and of drawing in colors had their birth. A new race, the immediate ancestry of which has not yet been definitely traced, supplanted completely the archaic Neanderthal race of Mousterian times.

Physically and mentally the Aurignacians, of which Cro-Magnon and Combe-Capelle are examples, were more nearly akin to modern European races than to the old Mousterians. Like the latter however, they were still hunters. Cave regions such as the Vézère valley favored the increase of population and a more sedentary mode of life. In time this brought in its train a scarcity of game

and fish, the chief food supply. These conditions evidently had much to do in

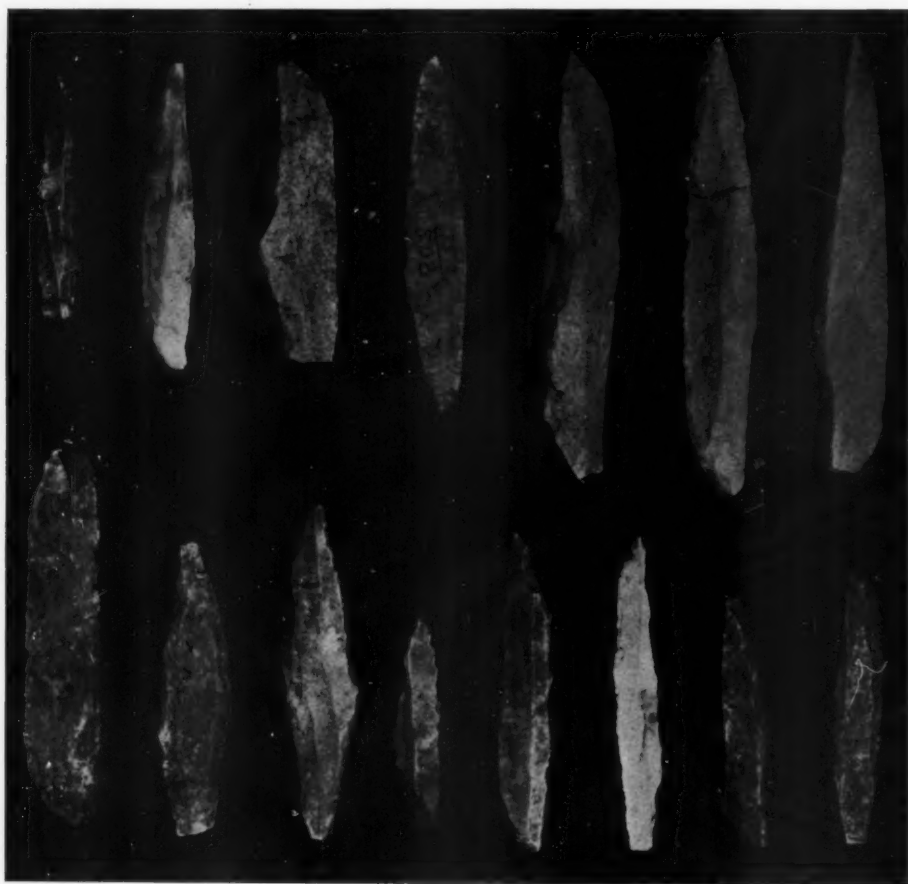


Lateral gravers from the Abri Blanchard of the Middle Aurignacian Epoch. The Aurignacian artists used gravers made by beveling variously shaped flints

the art development of that period. Nearly all the figures are of favorite game animals. Many of these are represented as hunted or wounded. These and perhaps many more are evidently votive offerings for success in the chase. Other scenes depicted are obviously intended to have a bearing on the multiplication of game. Art and magic therefore were thus early taught in the same school of necessity.

The thickness of the Aurignacian deposits from caves and rock-shelters and the evolution of the culture there portrayed prove the epoch to have been a long one. Many Aurignacian loess stations have recently come to light

making it possible to determine approximately at least the relation of the Aurignacian epoch to glacial chronology. Aurignacian remains occur in the middle and upper part of the recent loess which is assigned to the Würm glacial epoch. Moreover in the cave deposits at Sirgenstein and elsewhere, Schmidt has found immediately below the oldest Aurignacian layers an Arctic fauna characterized by *Myodes obensis*, a species of lemming. The Aurignacian began therefore very near the maximum of the last glacial epoch. Schmidt believes this to have been the second and last maximum advance of the Würm glaciation, the one directly preceding the Achen retreat.



Flint *pointes de la Gravette* from rock-shelter No. 2, Roches-de-Sergeac (Dordogne)



**SIMPLE FLINT GRAVERS REPRESENTATIVE OF THE UPPER AURIGNACIAN AGE**

This Aurignacian Age toward the close of the Quaternary is thought to have been the time of a new race (Cro-Magnon) which had completely supplanted the race (Neanderthal) of the preceding epoch (Mousterian). The proof lies in such human cultural remains as these flints together with the rare human fossil remains, and the associated animal fossil remains — the horse the dominant animal, the mammoth still flourishing and the reindeer coming into prominence



The American Museum contains these tallies or *marques de chasses* from Abri Blanchard (Dordogne) representing the Middle Aurignacian Epoch, interpreted as records made by Aurignacian hunters

We can thus picture the climatic conditions that attended the birth of Quaternary art in western and central Europe; and climate is no mean factor in the environment of primitive man. Among other things it determines the character of the fauna and thus has a bearing on the fundamental problems of food-getting as well as defense.

Upper Quaternary fauna may be reconstructed from the fossil remains associated with human cultural remains;

it is also reflected in the art of the time. Judging from both these sources one arrives at the conclusion that Aurignacians and Solutréans were contemporaries of an *Equus* fauna with the horse predominating, the mammoth still abundant, the bison also plentiful, and the reindeer gaining in prominence. The horse and reindeer were dominant in the Magdalenian. *Bos primigenius* plays a secondary rôle in the art of the time and is not conspicuous for its fossil

remains. On the other hand the one station of Solutré (Saône-et-Loire) has furnished skeletal remains of no less than one hundred thousand horses. Moreover in an inventory of Quaternary art the horse leads all with the possible exception of the bison. We are therefore justified in assuming that the steak of horse and bison, and not our indispensable beef steak, was the *pièce de résistance* at all well-regulated palæolithic feasts.

A short distance below Sergeac (Dor-

dogne) on the left bank of the Vézère is a picturesque little valley cut in the limestone formation by a small brook, *Ruisseau des Roches*, tributary to the Vézère. This valley is flanked by shelters that have crumbled away until there is now little if any overhang left to the rocks, the entire group being referred to as *Station des Roches*. Several of these shelters were inhabited by palæolithic man.

This region had been partially ex-

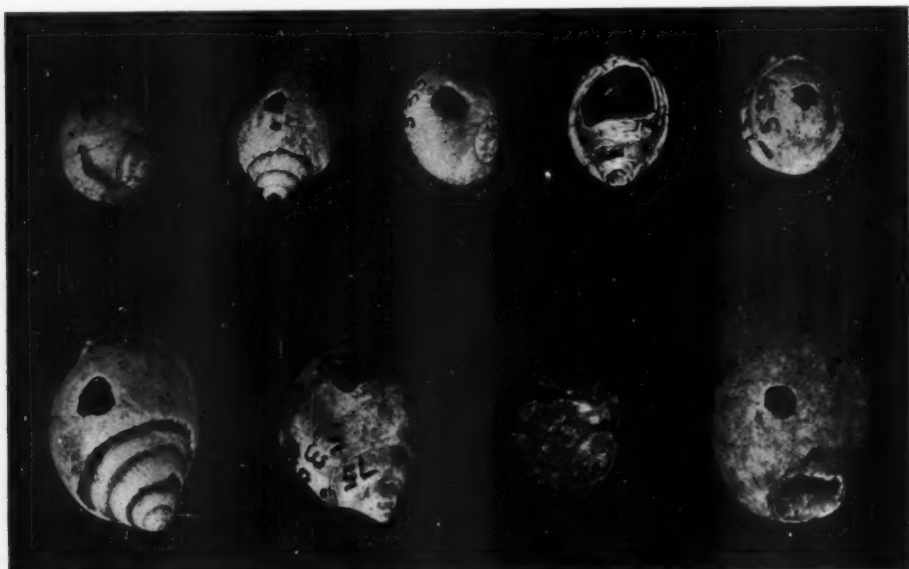


Perforated teeth from the Abri Blanchard (Dordogne), of the Middle Aurignacian Epoch. Excavated caverns and rock-shelters yield large numbers of perforated teeth of the cave bear, lion and reindeer, proving the love of adornment of the Aurignacian people

plored by several prehistorians, including M. Reverdit (more than thirty years ago) and the Abbé Landesque. Recently M. L. Didon, proprietor of the Grand Hôtel du Commerce et des Postes at Périgueux, took leases on some of the more promising shelters and began excavations. The excavations at the Abri Blanchard des Roches, a station representing the Middle Aurignacian Epoch, had been practically completed before our visit and a paper<sup>1</sup> published on the

the valley and within but little more than a stone's throw is the Abri Blanchard des Roches, from which likewise the New York museum secured a collection.

When one comes to weigh the various elements in Aurignacian culture and compare them with Mousterian culture the differences are at once seen to be as great as the physical differences that separate *Homo neandertalensis* from the Aurignacian races. The change from



Perforated shells used for personal adornment from the Abri Blanchard (Dordogne) of the Middle Aurignacian Epoch

results. Station No. 2 des Roches de Sergeac, belonging to the upper Aurignacian epoch had been partially explored by M. Didon who found there not only the large engraved figure of a horse but also many industrial remains of which the American Museum obtained the greater part. These objects were found halfway up the sloping hillside under a thick coating of talus that once formed the overhanging rock. Diagonally across

lower palaeolithic to upper palaeolithic is so great as to mark in all probability the invasion of a superior race with more advanced culture standards. This new race colonized practically the whole of the Mediterranean coast, African as well as European. The Aurignacians might have come from Africa. One can scarcely think of an oriental origin, for early Aurignacian culture has not as yet been found in Eastern Europe, as pointed out by Breuil.

Lithically the Aurignacian was the

<sup>1</sup>L. Didon in Bull. Soc. Hist. et Archéologique du Périgord Périgueux, 1911.



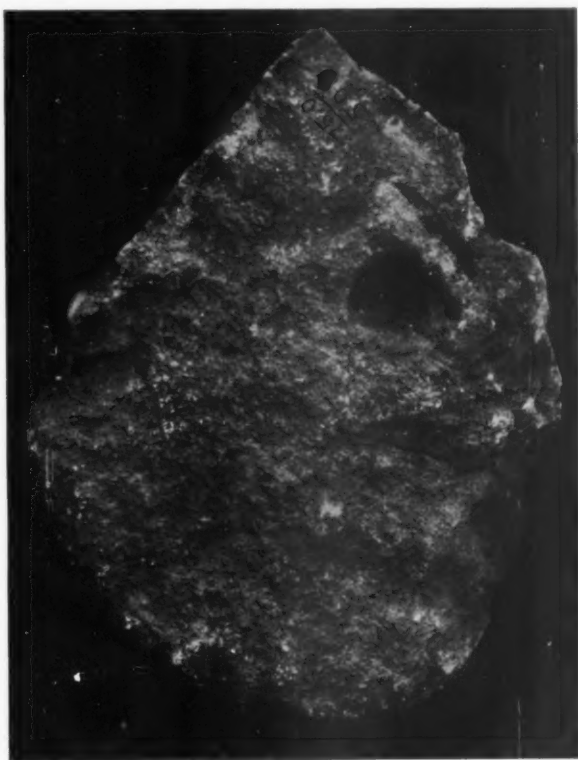
epoch of the evolution of the bladelike flint flake, with its diversity of marginal retouches. In the lower levels the blades are large and thick with marginal notchings. Large, rude carenate scrapers appear, likewise the lateral type of graver, and the so-called *pointe de Châtelperron*. Bone industry develops, the bone point with or without cleft base being the best known [page 226]. Sculpture is developed to a considerable extent, the female figurines from Brassempouy being examples. In the middle horizons the carenate scrapers multiply, diversify and become less bulky [page 225]; the scars left by the lamellar chipping are long and parallel. Gravers of many types are numerous [page 227].

The upper Aurignacian is characterized by the *pointe de la Gravette* [page 228], the ordinary graver [page 229], and a microlithic industry in which use is made of the splinters produced in the manufacture of gravers. Pedunculate points foreshadowing the arrow head are also met with. The human figurines from Grimaldi and Willendorf and the bas-reliefs from Laussel belong to this stage.

The American Museum possesses a series of records kept by Aurignacian hunters, the so-called *marques de chasse*. Bone was generally used for this purpose [page 230]. The collection also bears evidence to the love of ornament so typical of the Aurignacians in the perforated teeth of the cave bear, cave lion and reindeer [page 231] as well as in perforated shells [page 232].

One curious fragment of limestone in the collection is perforated, for what purpose it would be difficult to say [page 233]. The hole is pierced near the margin and was driven in at an angle from both sides to a meeting point. The block which is heavy might well have served as a weight. Or if the hole was made before the block became detached from the overhanging rock it must be considered as a point of suspension. Didon found a number of such perforated blocks of stone.

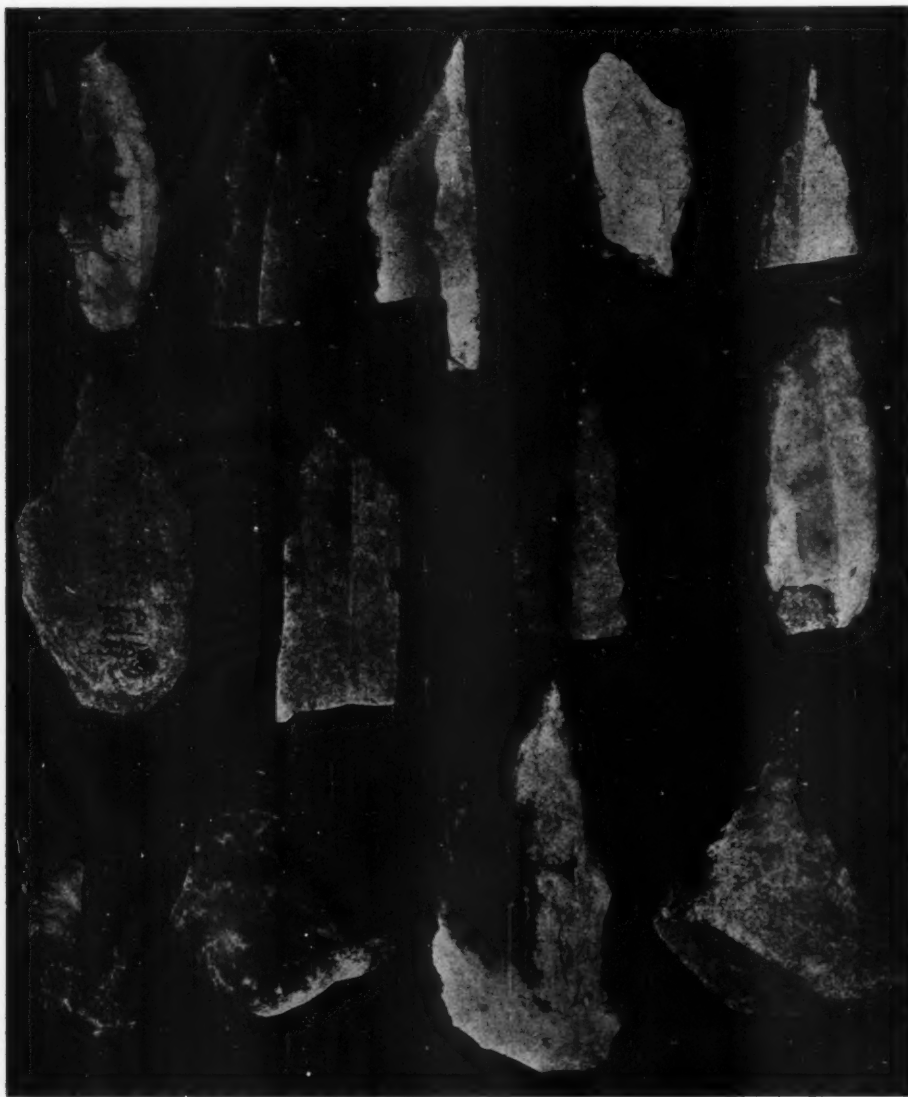
The principal piece in the New York collection is an engraved figure of a horse on a limestone slab, that was found in a deposit of upper Aurignacian age at rock-shelter No. 2 des Roches-de-Sergeac [page 236]. This figure, about



Large fragment of limestone from Abri Blanchard (Dordogne). The artificial perforation is driven in at an angle from both sides to a meeting point, and the purpose is difficult to guess. The stone is heavy enough to have served as a weight

sixty-eight centimeters in length, is cut rather deeply into the slab, the surface of which is rough and irregular and had never been prepared in advance for the engraving. Among the tools used by Aurignacian artists were a variety of graters made by beveling one or both ends of a bladelike flint flake. The work here was evidently done by a larger, heavier tool than the ordinary graver, as the

incisions are not only deep, but also broad. Flint tools that might well have served to do the cutting were found in the same station [page 237]. The size of the tool and the irregularity of the surface account in some measure for the apparent crudity of the drawing, which might have been considered as belonging to an early rather than a late phase of Aurignacian engraving.



Flint perforators of Middle Aurignacian Age. (From Abri Blanchard des Roches (Dordogne))

The artist is at times uncertain in his stroke. The curve in the region of the short standing mane is exaggerated and it is difficult to account for the irregularity of the line that begins at the base of the ear and ends at the back of the neck, a little forward of the withers. In drawing the fore legs a false stroke was made that begins at the chest and passes downward slanting outward a little in front of the fore legs. The inability of the artist to represent the legs, both fore and hind, in profile is likewise apparent. Each leg appears independent of its mate as if the two were seen from in front instead of from the side. On the other hand the shape of the body is characteristic for the small Quaternary horse of stocky build whose nearest living representatives are the horse from the desert of Gobi, *Equus przewalskii*, and the native horse on the Île d'Yeu off the west coast of France. That portion of the slab on which the tail and a portion of the outline of the hips were incised had been broken off and was not recovered by M. Didon.

Discoveries of unusual importance have recently been made by the Abbé Bouyssonie at the rock-shelter of Limeuil (Dordogne) on the west bank of the Vézère, opposite the point where it flows into the Dordogne. This station is of Magdalenian age and therefore of later date than the two shelters at Sergeac previously mentioned. Here also the artists left engravings on more or less shapeless slabs of limestone, seventy-nine of which have been recovered, and are now in the *Musée des Antiquités Nationales* at Saint-Germain. The ani-



Flint-scrapers of upper Aurignacian Age from rock-shelter No. 2 des Roches-de-Sergeac



Bone-polishers from the Abri Blanchard



Upper Aurignacian horse from rock-shelter No. 2 des Roches-de-Sergeac (Dordogne). This figure engraved on limestone is one of the principal specimens in the American Museum collection. The figure is about two feet in length and the lines are cut rather deeply. The gravers used must have been larger and heavier than those ordinarily found and in fact flint gravers strong enough for the work have been discovered. The general shape of the horse is typical of the stockily built Quaternary horse whose nearest living relatives are the species from the desert of Gobi, *Equus przewalskii*, and that native to the île d'Yeu off the west coast of France.

It is rightly the policy of the French Government to set aside all caverns containing palaeolithic drawings and paintings as national galleries of prehistoric art. Each discovery is reported at once to the Paris Academy of Sciences. Thus museums in America are never likely to display the originals and must depend on copies such as have been recently transferred to the walls of the hall of European prehistoric archaeology in the American Museum.

mals that chiefly figure in this list are the reindeer, horse, bison, and wild goat. The most beautiful of all is the reindeer represented as browsing. For artistic merit it ranks with the celebrated reindeer of Thaugen.

Figures of the horse are no less interesting. They seem to comprise three fairly distinct types according to Capitan: first, a horse of slender build, small head and erect mane, corresponding to the modern ass; second, a true horse with short but large head, but rather slender body; third, a stocky, hairy horse with heavy mane.

In addition to the engravings on stone slabs some rare examples on bone were also found at Limeuil, one of which was obtained by us for the New York museum. The figure in question is incised on a fragment of the metatarsal of a reindeer and is evidently one of at least two figures, probably a procession. The one most complete lacks the nose, upper part of the head including eyes and left ear, and the fore legs. The hind legs were never indicated. The line of the neck, back and tail forms a graceful sweeping curve. The ear is well drawn, the ear opening being

suggested by an incised line. Its direction, neither forward nor backward, and the general attitude of the figure suggest repose. The length from ear to root of tail is twenty-three millimeters. The only uncertain stroke of the graver is to be seen in the region of the throat. The numerous nearly vertical and parallel fine lines on the neck and back may not be of human workmanship, as similar lines are to be seen at the extreme left of the bone fragment and apparently not related to any animal figure. The figure of a second horse following at a short distance the first described, has

been lost with the exception of the two ears. Here again the left ear is turned so as to show the opening. This specimen represents a late phase of Magdalenian art.

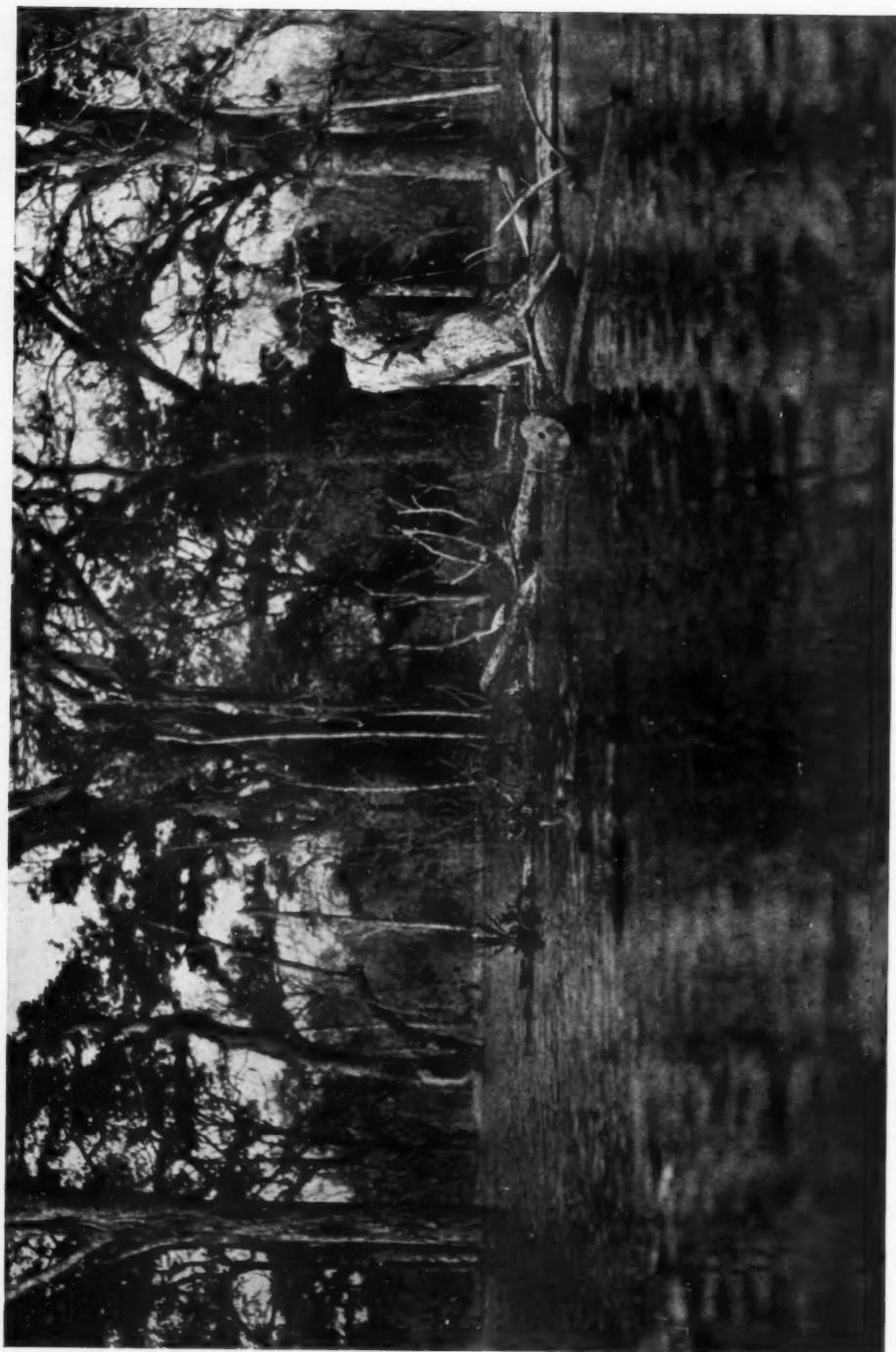
Wherever possible it has been the policy of the French Government to set aside as national monuments all caverns and rock-shelters in which are examples of palæolithic mural art. These will ever remain galleries of prehistoric art. Only in one or two rare instances have parietal engravings or frescoes been cut from their original places. Such a step should be resorted to only when not to remove

the art works would be to invite certain destruction. Where works of this nature are accessible and can be permanently protected, there is as little sense in removing them as there would be in removing the frescoes of Michelangelo from the Sistine Chapel. The museums of this country are not likely ever to possess typical original examples of palæolithic mural art. The American Museum has acted wisely therefore, in transferring to the walls of its hall of European prehistoric archaeology copies of some notable originals from the French as well as the Spanish caverns.



Probably crude graving tools; at the left from rock-shelter No. 2 des Roches-de-Sergeac; at the right from Abri Blanchard. These graters are large and heavy enough to have served to cut deep lines in limestone as shown on the preceding page





#### NEWLY FLOODED FOREST ON THE RIO TRINIDAD

Rivers in the Gatún region have risen, as this photograph indicates. The lake of the region, previously a negligible one, has now an extent of one hundred and sixty-four square miles and a depth in places of seventy to eighty feet. In the photograph an iguana can be seen on the upright stump and a white egret on the log at the centre



Water front of Panama City where the boats come in to market, in the early morning soon after day break, loaded with fruit and vegetables from the neighboring islands

## NEW FAUNAL CONDITIONS IN THE CANAL ZONE

By H. E. Anthony

With flash-light photographs taken by Mr. George Shiras and many photographs by the Author

**D**URING the months of February and March of this year it was the good fortune of the author to accompany, as an American Museum representative, Mr. George Shiras, 3d, on a trip to the Canal Zone. Mr. Shiras desired to obtain photographs by flash light of the animal life of that region, a method of which he is one of the foremost exponents to-day and

which has yielded him some remarkable results in temperate regions. It was through his generosity that the Museum was able to send a collector to Panama with him.

It was expected that faunal conditions in the Canal Zone would be undergoing abrupt changes because of the damming of Gatún Lake and the consequent extensive high water. From a basin with no lake worthy the name, with standing water confined largely to marshy areas except during the height of the rainy season, the Gatún region has been transformed by the huge dam at the locks into a lake of one hundred and sixty-four square miles in extent and a depth of seventy to eighty feet in many places.

**EDITORIAL NOTE:** The expedition worked under authority from the Canal Commission. It is of note that Colonel Goethals, as the first civil governor of the Canal Zone, continues adherence to the policy he maintained during the engineering work in the region — namely, that the isthmus shall be a game preserve. Exception to the observance of the laws against shooting game outside a short open season will be made only in favor of such occasional zoölogical expeditions

This flooding of ground formerly high and dry, it was anticipated, would drive many animals to seek new homes or might even threaten some of the more restricted, lowland-living animals with extermination. Incidentally many of the islands and ridge crests left above water might have a concentrated fauna driven there from the adjacent flooded localities. Other phases of the question dealing with the newly created lake, were

vestigation, it was planned to work from a house boat as a base camp with a launch and small boats for side trips. Accordingly a boathouse was made over by a few alterations, but only after considerable time had been spent in trying to secure something available for the purpose. The house boat was so low in the water that she could be towed only in a calm sea, a condition of the lake only rarely met with, and at the best



It was because of the flooding of the Gatún Lake basin by the huge dam at the Gatún locks, thus causing abrupt changes in the faunal conditions, that an expedition under the patronage of Mr. George Shiras, 3d, was undertaken. The house-boat formed the base camp from which trips were made by launch or small boat, sometimes along rivers which heretofore have been inaccessible owing to shallow water. The house-boat had sides of cheese cloth and copper screen to keep out mosquitoes

the wiping out of the lowland forests by submergence, the rise of new aquatic flora such as the water hyacinth, and the probable inhabitation of the lake by water birds. Such were some of the items in the purpose of the expedition and we were equipped to take advantage of these new conditions if the foregoing assumptions proved correct.

As Gatún Lake was the center of in-

the launch could make but slow time pulling her. Late afternoon of March 6 saw us leaving Gatún with the house boat and by three o'clock the next morning we were tied up at the head of a water-way or *trocha* that branched off from the Rio Trinidad. This was our main camp and we hoped to be able to work the undisturbed jungle from here. Unfortunately, a plantation near by, a

young fruit district only recently made accessible by high water, chose this time to burn over some clearings and we found that the smoke materially interfered with our success. Cameras with flash lights and bait were set out in promising spots, lines of traps for mammals were run daily, while the jungle was hunted in hopes of shooting specimens.

It was at this spot that we made the acquaintance of the largest of the Panamanian monkeys, the "black howlers." Frequently their queer booming, roaring, howl echoed through the jungle, a call that carries for long distances. They howl oftenest just before or during a rain storm and the natives thus look upon them as weather prophets. Upon one occasion I stood almost under some trees through which a troop was passing, while the first big preliminary drops of a sudden shower pattered upon the leaves about me. The volume of sound that issued from the black shaggy throats was so great and so suggestive of a large animal, a lion for example, that I found it hard to reconcile myself to the actual facts. I felt a pang of regret at silencing one of the "howlers" but as a specimen was needed I shot one of the foremost and heard him crash through the limbs to the ground. Pangs of a more effective sort were experienced when my native boy and I attempted to retrieve the monkey, for he had fallen underneath a bees' nest the size of a bushel basket and we found the nest too late to avoid it.

Other interesting mammals encountered here were the

pretty squirrel-like marmoset, the short-haired anteater and several species of opossum, while we were continually wondering at the variety of the bird life and the diversity of the bird songs and call-notes. The noisy parrots that shouted in the morning until the jungle rang with their tumult, the grotesque toucans which at times vied with the parrots, the calling of the parrakeets and the peculiar chorus-like calls of the chachalaca, or "wild turkey," produced an impression that must ever be associated with jungle memories. At night mysterious noises were heard from unknown sources and one weird laughing call in particular



The black howler, the largest of the Panamanian monkeys, is looked upon by the natives as a weather prophet, its loud, long and reverberating howl being most frequently heard just preceding a heavy rain



The common method of navigation of small streams by the native Panamanians is by means of the *cayuca* or dugout, which varies in length from eight to thirty-five feet, and is cut from a single tree. These boats are used by the natives for bringing fruit and produce to market and it is a common sight to see them loaded with sugar cane cut in sections eight or ten feet in length



Scene on the Rio Chilibrillo up which trips were made to visit the bat caves. As palms never grow in water, something of the extent of the flooding of this region can be judged



caused conjecture to run rife, there being as many opinions as there were listeners.

Besides the work done on the Rio Trinidad, several long trips by launch were made up the Rio Chagres, one as far up the river as the launch could ascend and two others up the Rio Chilibrillo to some limestone caves for bats. On these trips it was found that the rising waters had ascended far up the river valleys, which in this part of the region have very little fall, making them navigable to launches where formerly it would have been impossible to take a *cayuca* or native dugout. Some of these flooded rivers — rivers by courtesy, for in the States these streams would be called creeks — with their banks densely lined by jungle vegetation which met overhead and dropped long vines and streamers into the waters, were very beautiful.

Everywhere we found the forest inundated. In regions early flooded, where the trees were submerged for the greater part of their height, all the trees were dead and leafless with an occasional great clump of orchids, the only green left. Many square miles of the surface of Gatún Lake are thickly studded with dead tree-tops of what was at one time splendid tropical forest. In regions of later high water many of the trees were still green and blossoming; especially was this so along the shores where but the lower part of the tree trunks were under water. It is not improbable that some of the more resistant trees may live to a ripe old age with their roots some feet below the surface of Gatún Lake, for some species were found flourishing among their long since dead companions. No new aquatic growth, arisen to take advantage of the altered conditions, was noted, but the conditions had probably not been in operation

long enough to bring about such a growth. The dead trees are constantly falling and the far-reaching crash of their descent is one of the common sounds of the lake.

Gatún Lake will undoubtedly produce new economic conditions among the natives of the adjacent district. These natives formerly had no other waterways but the few rivers that traversed the interior basin, and were available for navigation only to a limited number of villages. Such rivers were the Chagres, Trinidad and Gatún. Now the far-extending lake shores provide such an accessible waterway that the natives are learning to navigate on lake waters, and every morning their *cayucas* may be seen lined up at the native market along the lock-front at Gatún. Being primarily river boatmen however, they are yet somewhat distrustful of the lake winds and do most of their traveling at night when the winds die down. During the dry season, from January to April, the winds blow across the lake toward a northern quarter of the compass and just the reverse holds true for the rest of the year. This wind at times becomes strong enough to threaten small boats seriously, and at practically all times of the day would be a strong check on the progress of the native dugout that was facing it. We found it necessary to move the house boat always at night and in the early morning hours because of this wind, and this proved a serious obstacle to working many localities, because it was out of the question to run at night without a moon, and when we most wished to move we had a late rising moon. After driving the launch full-tilt over a floating tree and into partially submerged bush and tree tops, trying to steer by lantern light, we confined our future movements to moonlit hours.

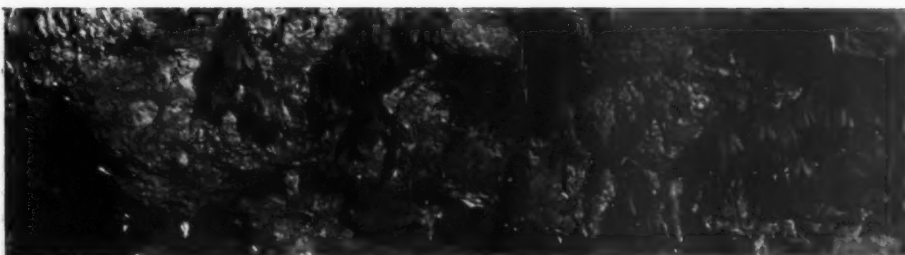


The low entrance to limestone cave on the Chilibrillo River opens into a series of long corridors and chambers more or less intercommunicating



Flash light photograph of bats. They were isolated by species and sexes, each species confined to a particular grotto where it was found in hundreds and the bats of each mass all of the same sex

Whenever one left the waters of Gatún Lake the dense, unaltered jungle was at once encountered and no matter how much its beauty was to be admired from the boat, its impenetrability was no less to be deplored. It was useless to attempt to leave the trail without recourse to the *machete*, the long brush knife of Latin America, and many were the varieties of briars and thorns to be avoided. Once into the thick growth of the jungle, the hunter found it necessary to stand minutes in one spot in order to look into all the arboreal nooks and crannies, so many were the possibilities, so many the great orchid-covered limbs and wide branching trees, and so loath to move the denizens of the jungle. The orchids and epiphytic air plants were very abundant and became so heavy a burden at times as to break down the limb or even the entire tree that harbored them, and not infrequently I witnessed the downfall of some tree overburdened in this manner, once in-



*Photograph by George Shiras, 3d*

Flash light of small cluster of bats before alarmed. Clusters are ordinarily formed of a great number of individuals, probably several hundred in some instances. The variety shown is one of the largest of South American bats, one specimen secured having a wing expanse of twenty-six inches. The bats are strong and muscular and always ready to bite. The masses of bats bear a close resemblance in form to the stalactites with which the walls and domed ceilings are covered

deed warned by a premonitory cracking, I was forced to move with considerable speed to escape a flying limb.

Mosquitoes, the former bane of early Canal days, were found but sparingly. Even outside the district of government patrol we were bothered but little by them, although we were told that later, during the rainy season, they were much worse. A few spots were encountered where mosquitoes were bothersome, thus arguing a local distribution. The ticks and red bugs however made up in diligence for any slights we might feel we had suffered from not being met by mosquitoes. The jungle everywhere seemed to harbor these pests and they did all they could to make life miserable for us. Ants also were found in abundance and it was fortunate indeed that our camp was a floating one and thus cut

off from inroads of these nuisances. One species of ant in particular will be long remembered by two members of the party, for it stung with a venomous



In a bat cave. Showing method of photographing bats by flash light. As the flash-light powder used is exceedingly explosive the expression of apprehension on the face of the operator is not to be wondered at

vigor never equalled by any bee and made the victim imagine he had been struck by a snake at least.

Concentration of animal life had taken place at the rising of Gatún Lake, and most of the islands formed had many inhabitants at first. The Gatún Hunt Club however soon reduced the population of these islands by hunting them with hounds and as the quarry in most instances could not leave the island the result was a clean sweep of all the larger species. We were too late, consequently, to find abundant game on any of the islands near Gatún. I accompanied this Hunt Club on one occasion, securing two peccaries.

The most efficient method of hunting the Panamanian jungle was by means of a headlight at night. The rays of the

light, worn on the hunter's head, are reflected by the eyes of the animal which shine like two orbs of fire — red, green or bluish depending on the animal "shone." The hunted animal will see nothing but the approaching light and falls an easy victim to the rifle or shotgun. On account of the danger to domestic stock and to people by promiscuous shooting at night, this method has been prohibited on the Zone but beyond Zone limits it is to-day the favorite mode.

The trip resulted in a good series of flash-light photographs of opossums and some of the smaller mammals. The apparatus for "flashing" the animals was set out by some runway or water-course where animals were apt to pass, and consisted of a mechanism to fire a magnesium flash and at the same time



Photograph by George Shiras, 3d

Flash-light picture of paca (*Agouti paca virgata*), one of the largest of the existing rodents, the closely-related carybara alone exceeding it in size. The paca is an animal of nocturnal habits and therefore can be photographed only by means of flash-light apparatus set at night. Note in the animal's mouth the mango which was used as bait. This is one of the game animals of the natives who call it *conejo pintado* or spotted "rabbit"

trip the shutter of the camera which was fastened in a manner to command the trail. A thread attached to a bait and stretched out before the camera, fired the flash when the animal pulled it.

Series of the rodents and the smaller mammals were secured for the Museum collections and for the most part are of species not hitherto represented. The time was too limited to secure many of the larger mammals which are found in the Zone.

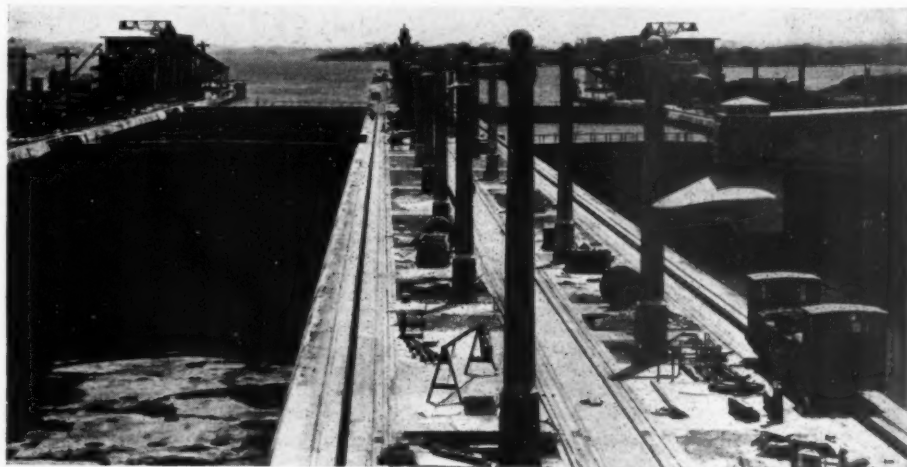
The expedition was greatly helped by assistance from the Canal Commission. Colonel Goethals issued special permits allowing collections to be made and at every turn we were assured the coöperation of the Zone authorities. Aside from the help received through official channels the members of the expedition were tendered assistance by the



*Photograph by George Shiras, 3d*

Flash-light photograph of one of several varieties of opossums encountered in the Canal Zone. The particular opossum shown is the commonest species and by reason of its abundance and its omnivorous appetite, it proved a serious obstacle to flash-light photography. Probably seventy-five per cent of the flashes fired were sprung by opossums who found and fired the camera shortly after dusk before better game was moving

residents. They found such a friendly spirit that many of the inconveniences of foreign travel disappeared, and it was with genuine regret that we left that bit of the States transplanted into Panama and known as the Canal Zone.



Lake end of Gatún locks looking out over Gatún Lake. Three different stages in filling the locks are shown, the lock at the left being empty, the one in the lower right-hand corner half full and the one in the upper right hand corner full. Emergency dams are seen in the background. Four locomotives similar to the one shown are to be used for each ship, two being in front and two in the rear





#### COPPER QUEEN MINE MODEL

The work was financed and supervised by Dr. James Douglas and directed by Dr. E. O. Hovey. Horizontal and vertical scale of model, one inch equals twenty-four feet. The men (Mr. Briesemeister is at the right above) are installing the buildings, finishing the surface and lining the geological formations

## THE COPPER QUEEN MINE MODEL

By Edmund Otis Hovey

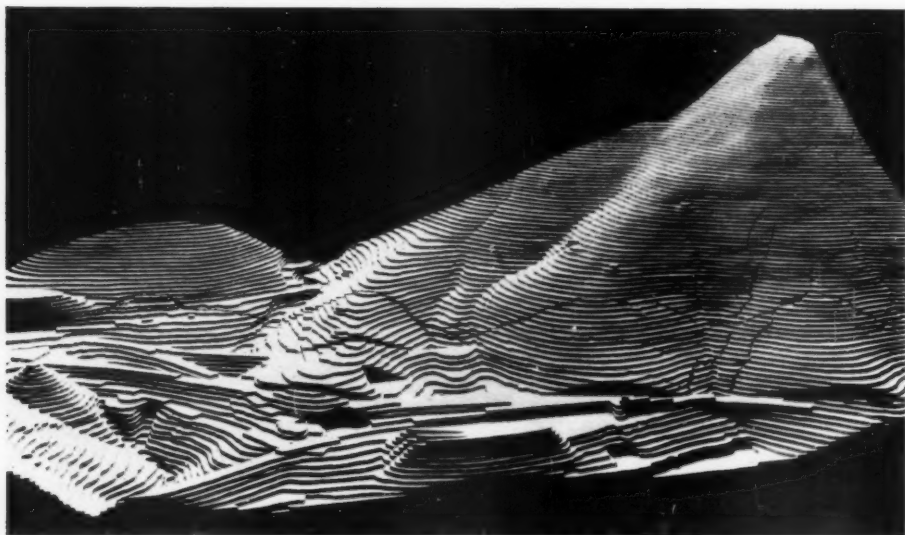
EARLY in 1910, Professor James Douglas of New York City, notified the authorities of the American Museum of Natural History that he was prepared to furnish the data and the means necessary for the construction of a large scale model of the Copper Queen Consolidated Mining Company's property at Bisbee, Arizona, along lines which have proved so successful and popular in the Museum in representation of birds in their habitats.

Accordingly in August of that year, the writer started for the Southwest, taking with him Arthur Briesemeister, a thoroughly trained and successful map-maker, William B. Peters, a preparator of long experience connected with the department of preparation of the Museum, and Thomas Lunt, the Museum's official photographer. Soon after arriving at Bisbee the party, under the leadership of E. F. Pelton, chief engineer of the Copper Queen Company, went into the field and determined upon the point of view from which the picture of the model as a whole with its proposed painted background should be obtained. In the model to-day practically the same view is spread before a person who stands in the middle of the platform in front of the model.

A scale of twenty-four feet to the inch had been decided upon for the reproduction, hence it was necessary to go into great detail in making photographic and other notes and in drawing base maps. The Company had a map on the scale of eighty feet to the inch with twenty-foot contours. Taking this as a foundation, Mr. Briesemeister corrected and brought up to date, roads, buildings and contours, intercalated five-foot contours and noted rock ledges and other peculiarities of the

surface. Record was made of the color of paint on each building, the nature of the material used in construction, the shape and character of the roof, the position and nature of vines, shrubs and trees, and in fact all other features that would be useful in making a naturalistic reproduction of the region determined upon as the portion to be represented. This area is L-shaped, the back of the L being curved, with extreme dimensions of 18 feet 6 inches by 11 feet 2 inches, representing an area 5315 feet long by 3418 feet wide. Numerous color sketches were made by Mr. Peters and plants were collected by him, all of which have been useful in getting the surface features to look natural. Oil sketches made by Mr. Lunt together with photographs made by Mr. Lunt and myself, were used by Bruce Horsfall, the nature artist, in painting the background.

After spending several weeks in the field, the party returned one by one to New York and in February, 1911, the active construction of the model was begun. The map sheets were enlarged to the required scale and all the detail entered upon them. Wooden boards  $\frac{5}{24}$  of an inch thick, representing the distance between two consecutive five-foot contours were cut according to the contours and built up on sectional foundations, there being six sections in all in the model. The exposed edges of these boards, therefore, corresponded to the contours of the enlarged map. Then the surface was modeled on in clay by Mr. Briesemeister, assisted by his son, William Briesemeister, utilizing the photographs constantly in making the surface approach nature in its appearance. After the clay surface was finished J. C. Bell, the Museum's

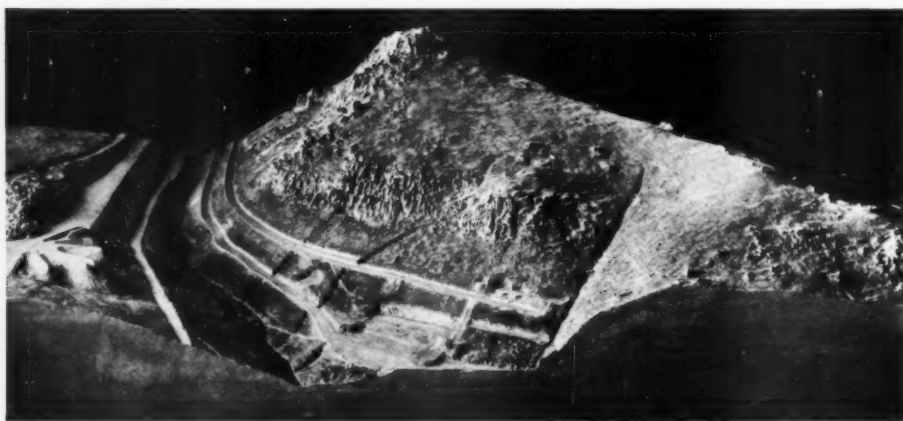


Copper Queen Mine model. Wooden core of one section of the Copper Queen Mine model. It was built up of boards  $\frac{5}{8}$  of an inch thick, the exposed edge of each representing a five-foot contour of the map

plaster-worker, made piece molds and plaster copies of the sections, one set of which was sent out to the Company at Bisbee for the use of the engineering and geological departments of the mine.

The construction of the head frames, shaft houses, loading bins, dwelling houses and other buildings within the area represented was no small task, inasmuch as there were several hundred of

them to be made. After experimenting with wood, plaster and other materials, we finally made the metal buildings, which are corrugated iron in the field, out of brass covered with thin sheet zinc scored to scale to represent the corrugations, while the dwelling houses and other small structures were made of cardboard. The head frames, loading bins, railroad tracks, locomotives, cars



One section of Copper Queen Mine model, showing the surface of clay modeled upon the wooden core. It is ready for making the mold from which to cast the final surface in plaster

and the like, are made of brass. The cardboard houses were made by H. Bierce; the metal work was done by Frank O. Crich. Cutting the contours and building the wooden portion of the model was done by Mr. Briesemeister aided by Andrew Latzko and Prentice B. Hill.

When the model was originally projected, the plan was to represent only the surface with a painted background showing the surrounding mountains, but there became evident as soon as work was actively begun, the desirability of representing the underground workings of the mine too, as fully as might be practicable. It was decided furthermore, to build a working model of a single stope on a scale of six feet to the inch to represent details that could not be indicated on the big model.

The representation of the underground portion on the large model was a matter of serious difficulty and led to the making of several experiments. Finally it was decided to excavate the under portion of the model and to put into the hollows thus formed, reproductions of the stopes in solid wood cut according to the detailed plans of the levels as furnished by the engineers of the Company. Tunnels, raises, winzes and shafts were likewise constructed to scale according to these plans and inserted in their proper places, the result being a very satisfactory representation of the stoped-out ore bodies lying between the Czar and the Lowell shafts, which are a mile apart. No effort whatever has been made to represent or even to indicate the position of ore bodies which have not been exploited. In sawing out and building up these stope models, Mr. Hill's practical knowledge gained through several years' work underground as a miner in the Southwest has been of great value. The sides of the model

have been used to give the geological sections along several vertical planes from 4100 feet above the sea up to 5900 feet on the Queen Hill, according to data furnished by Arthur Notman and Max Roesler, the geologists of the company.

The large-scale stope model is based upon data derived mostly from the Gardner Mine, the distance from surface to stope and from stope to main shaft being lessened and the position of the waste dump and loading bin with reference to the head frame being changed to meet the requirements of our limited space, but the square sets, man ways, ore sheets, tunnels, shaft and machinery have been built to scale from the plans of the actual work and photographs. The engine, however, is driven by an electric motor with automatic reverse, cunningly devised by Mr. Crich, concealed underneath the shaft house.

All the work was done in the Museum under my immediate direction, with assistance and advice in supervision from Dr. James Douglas and the engineers and geologists of the company during the progress of the work. Furthermore we utilized to the full the results of Frederick L. Ransome's exhaustive study of the region as published in the *Bisbee Folio* (No. 112) and *Professional Paper* No. 21, issued by the United States Geological Survey. The model represents the region as it was in August and September, 1910, it being impracticable to keep pace in the model with the changes constantly being made at an active mine.

The present property of the Copper Queen Consolidated Mining Company consists of 194 claims, covering about 21,350 acres of land. The rocks in which the ores of copper occur at Bisbee are Palæozoic limestones and sandstones, which have been much disturbed and faulted and have been penetrated in

places by dikes and bosses of granite porphyry, an igneous rock. The fault zones and intrusions were probably the channels through which the ore reached the limestones. Subsequent to their deposition, these zones and adjacent rocks have been altered and converted into masses of highly ferruginous and maniferous clays and other products, locally known as "ledge matter," within which the profitable ores have been redeposited by a process of natural concentration as secondary oxydized (malachite, azurite, cuprite) and secondary sulphide (chalcocite) minerals. This extensive alteration is confined to the carboniferous limestones, but as the model shows, masses of unaltered ore (sulphides) have been met with, imbedded in the Devonian and even in the Cambrian strata.

The ore is raised to the surface through one central shaft, the Sacramento, though access to the different sections of the mine is obtained through six subsidiary shafts, four of which are shown in the model: the Holbrook, Spray, Gardner and Lowell. The mine is opened by fifteen levels one hundred feet apart vertically, the ore bodies between the various levels being reached by upraises, or by descending passages called winzes. As the ore is extracted, the exposed ground must be supported by timbers and the vacant space filled with waste rock to insure safety. The ore as extracted is thrown down to the next lower level through chutes, from which it is transported in small cars drawn by electric locomotives to the central shaft.

From the Sacramento shaft the ore is dumped onto a belt-conveyor which distributes it into waiting trains of railroad cars. This operation mixes the ores from different stopes to some extent. The trains take the ore to Douglas, Arizona, twenty miles away where

the great smelter is located. There the ore is dumped into long pits or "beds" between the railroad tracks, further mixing of the material being accomplished during this operation. Hither, are brought also sulphide ores as concentrates from the mines at Nacozari, Sonora, Mexico, for admixture with the Bisbee ores, which are too largely carbonates and oxides for economical smelting by themselves. Steam shovels transfer the mixed ores from the beds to cars for the final journey to the smelter, where together with the proper amounts of coke and limestone they go into the blast furnaces and thence into the converters. The copper ingots which result from this treatment are brought to New York to be refined, the final products being pure copper and considerable quantities of silver and gold.

The first claim actively worked was the Copper Queen, on which operations were begun in the summer of 1880 by the Copper Queen Mining Company. In the following year, exploration was begun in the neighboring claims by the Atlanta Mining Company. In 1885, the two companies consolidated as the Copper Queen Consolidated Mining Company. Subsequently, the properties of the Holbrook and Cave Mining Company, the Neptune Mining Company and the Lowell and Arizona Mining Company were acquired and other claims bought.

From the time when mining was begun in 1880 up to the end of the year 1912, there were extracted from these mines 7,729,922 tons of ore of an average copper content of 7.16 per cent. The metal production in this period was as follows: copper, 1,106,605,774 pounds (553,303 tons); gold, 104,775 ounces Troy (8,731 pounds); silver, 6,107,421 ounces Troy (508,952 pounds).





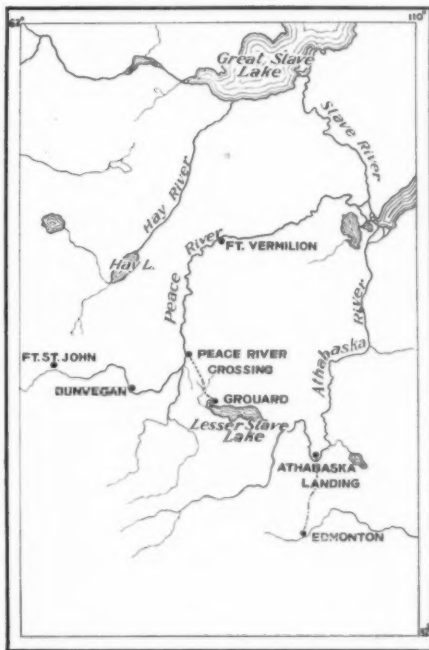
View north from the high banks of the Peace River at Fort St. John, showing the islands at a stage of low water in the river. In three hundred miles there are some two hundred islands wooded with spruce and pine

## ALONG PEACE RIVER

By Pliny E. Goddard

THE Peace River was first brought to the notice of the world by Alexander Mackenzie. Not satisfied with following to the Arctic Ocean the river which bears his name, he went up the Peace River, crossed the Rocky Mountains and made his way to the Pacific Ocean which he reached in September, 1793. The previous winter he had spent at Fort MacLeod, built for his convenience and afterwards continued as a trading post. Fort MacLeod is located on the north side of Peace River six miles above Peace River Crossing and nearly opposite the mouth of Smoky River. From that time until 1879 trade goods were brought to Fort MacLeod from Montreal or York Factory on Hudson Bay in canoes or York boats. In 1878 however, a road was cut from Lesser Slave Lake to Peace River Crossing, a distance of ninety miles, and the trade route was changed. The goods were taken up the north branch of the Saskatchewan River on steamers to

Edmonton, then by Red River carts drawn by oxen to Athabasca Landing,



The Museum expedition visited Ft. Vermilion, then proceeded upstream to Ft. St. John, before returning to Edmonton en route for the East



One of the many islands of the Peace River, heavily wooded with spruce which the Dominion Government does not allow cut. The river was liquid mud carrying driftwood and logs

Edmonton and from there by York boats and carts to the Peace.

Regardless of the route and means of transportation, the trading customs remained unchanged. Each fall the trading post supplied the Indians with powder, shot and balls, traps, tea and tobacco. These were usually given on credit, or as they still say in the North, "in debt." When winter set in, the

Indians went out to their trapping grounds. The man of the family established a line of traps and snares fifteen or twenty miles long and went back and forth over this line throughout the winter. When he found a beaver house he chiseled through it, having first made an enclosure so the beaver could not escape. The skins obtained in this way were brought to the trading post in

the spring. On arrival, the Indian received a present of tea and tobacco and in later years, flour. When he began trading, his "debt" was first covered, then he bought provisions, calicoes, blankets, and whatever his heart desired. All trading was done on a basis of "made beaver," a mere term used in trade and indicating at the present time on the Peace River an arbitrary value of thirty-three and a third cents. During the summer it was easy to live on the rabbits caught in snares by the women. One



Hudson's Bay steamer making a landing at Fort St. John. It carries settlers' freight as well as provisions for the various posts and brings back furs

or two moose hunts supplied a quantity of more nourishing food, some of which was put aside for winter.

So the years passed until the empty stomachs of Europe cried for more wheat. When the easily plowed and more accessible lands of Manitoba and Saskatchewan had been sparsely settled and pioneers had moved on to Grand Prairie, south of Peace River, Edmonton with its railroad became the commercial center of a vast region and rapidly grew from a trading post to a flourishing city. At the present time the railroads following the tracks of the old carts will soon reach the Peace.

It was with keen disappointment that the windows of the real estate dealers in Edmonton were viewed last summer. According to them Dunvegan, one of the earlier trading posts, had already become a city with many streets and buildings; Peace River Crossing was a flourishing town. All this brought visions of a region crowded with incoming settlers.

Gradually however, as the journey was pursued, the feeling of disappointment gave way. To be sure, the journey from Edmonton to Athabasca Landing was made on the train, but the slow speed and long stops on the sidings gave ample opportunity for observing the country. The evening of that day and all the following day were spent on what seemed then a *small* flat-bottomed river steamer, heavily loaded with freight. We slowly and painfully made our way against a stiff current up the Athabasca River between its well-wooded banks, and saw no

signs of civilization. The second night brought us to the mouth of Lesser Slave River where a town had just had its birth. There were a few poolrooms, half a dozen houses and many tents. After a half-day of bad roads and uncomfortable riding, we found a really small river steamer waiting for us.

The river was narrow and winding with banks about level with the upper deck. There was again no appearance of civilization. Muskrats were seen swimming in clear water and flowers grew on the banks almost within reach. There followed a day of rain on a wide lake where land was not to be seen — on such a day at least. That night when we reached the new town of Grouard came the first and almost the only blot on our enjoyment of the trip. A long sandy street was lined with new buildings. No doubt there were good-hearted, normal human beings there, but those in evidence were aggressive and grasping. It was painful to learn that the most disliked examples were Americans who probably had moved on to Grouard because they were not wanted at home.

Two and a half days spent on a wagon seat watching drizzling rain and clouds of mosquitoes, brought us through the



Protection at night from mosquitoes in the North. Muslin is used at the top to give strength, and cheese-cloth around the sides



Camp of Dunvegan band of Beaver Indians. Here can be seen the last stages of the hunting life, which is now giving way to agriculture because of the inroads of white civilization

ninety miles of small poplar timber along the trade road from Lesser Slave Lake to Peace River Crossing. Really the time should have been filled with thanksgiving, for it was the last speedy and not too uncomfortable trip to be made across this same portage for several months. Peace River Crossing did show signs of growth. But that "was n't too bad" as they say in the North. Undoubtedly the best part of it was that the "Grenfell," the little river boat that was to take us downstream, had steam up and dinner cooked when we arrived. About two that afternoon we crossed the Peace and took on several cords of wood.

With a whistle to jeer at the Company's boat which had expected to pull out before us and did not, we moved downstream.

The little "Grenfell" could make about fourteen miles, and the river itself was making eight because the water was very high. It was liquid mud carrying driftwood and logs — even whole trees. The sun slowly moved from south to west, from west to northwest, and then was hidden behind the river banks. That it had set we could not be certain for there was plenty of light until about eleven o'clock when we tied up to the banks so the engineer could sleep.



Fort Vermilion trading post of the Hudson's Bay Company, said to be the best stocked post in the North. Here a grist mill was maintained which also for many years furnished power for electric lights



Revillon Frères' trading post on Hay River, which is more than seven hundred miles by any available route from the railroad. Fires are kept burning to protect the horses from flies

The river is full of islands. In the three hundred miles there are about two hundred of them, covered with pine and spruce timber. As we proceeded the banks gradually grew lower and the river wider. That night we tied up at North Vermilion and went down to the river bank instead of up, the river was so high. Here six hundred miles from the railroad there are two little communities of whites and half breeds, one on either side of the river. They get mail once a month and are glad to get it, although it is usually two months old when it arrives.

The white people are well-read, well-educated, and have the true northern hospitality. The half-breeds form a class by themselves. They read a little French, but prayer books and catechisms are all that are available to them in French. Only a few of them have been as far from home as Edmonton, the others consider Vermilion the center of the earth.

With Vermilion as a base six weeks were spent in ethnological work. During this time a trip was made to a trading post on Hay River on the occasion of



Slavery Indians gathered to receive treaty money from the Dominion Government. An annual payment of five dollars for each Indian is made to heads of families in an effort to keep an accurate census and supervision over the tribes. Some refuse to accept the money and none have any conception of the outside world





Slavey Indians showing type of face common to the northern tribes. These Indians are generally rather light in color and are thoroughly primitive in manners and customs, although they have adopted white man's dress



The Indians of the north honor a person of importance by making a lob-stick. The one shown in the picture was made by Cree boatmen

"treaty paying". Nearly all the Indians of Canada receive cash payments from the Dominion Government once a year. A band of Slavey Indians, practically untouched by civilization except as to dress, trade at this post which is seven hundred miles from the railroad by the usual route of travel. The Beaver Indians who hunt between Hay River and the Peace are greatly reduced in numbers and considerably influenced by more than a century of contact with white and half-breed traders and servants of the fur company. A fair collection was made among them, and information secured which although scanty was very acceptable.

Returning upstream from Vermilion to St. John in August was another matter as regards speed. The current was not quite so strong, but the steamer belonged to the Hudson's Bay Company. The ways of the Company are still the old ways in the North. There must be a French-Cree word for *mañana* since the thing itself certainly exists. The boat was comfortable however, the weather perfect, and the companionship excellent. On that particular trip of the steamer there was on board a fine old Catholic bishop who had been a pioneer in the North, two sisters of charity, a Church of England missionary, a judge, two or more lawyers, superintendents of

trading companies, politicians and several surveyors. It took three weeks to reach Fort St. John where from the river banks, nine hundred feet high, the Rocky Mountains are to be seen. The first of civilization in the persons of several young settlers went to St. John with us.

Here also are remnants of once powerful Beaver tribes who in early days burned the trading post and killed the traders. As treaty had been paid considerably in advance of the advertised date the Indians were nearly all far back from the river securing food for the winter.

A week's stay was made at Dunvegan, some miles from which place a band of Beaver live on the reserve. Near them were several prosperous agricultural settlements. Dunvegan itself had not as yet responded to the efforts of the real estate agents at Edmonton. Its white population varies from three to five depending upon the movements of the mail-carriers.

Coming back to Peace River Crossing was pleasant and should have been easy. If one sits down on a raft or in a canoe and sits still he will quietly pass the two hundred and forty miles from St. John to Peace River Crossing. Our luck was a canoe loaned to us. Because it was the homeward journey the natural speed of the current, three miles, was increased to five or six by the use of the paddles. It is tiresome work, but a few days of it puts a large share of conceit into one when he tries his muscles against a loafer. Yes, there were bears, there always are on the Peace. This

was the time of ripe berries and there were many bears. We know that they, Indian-like, must have "made medicine" against us, for nothing else could have prevented our killing one.

We were very happy when Sunday night at eleven o'clock, two hours after



Alexander Mackenzie, a descendant of the original Alexander Mackenzie, explorer and discoverer of the river which bears his name. Mr. Mackenzie is standing on the site of Fort MacLeod where the earlier Mackenzie spent his first winter on the Peace River before starting out for the Pacific.

darkness had come in the early days of September, we paddled our canoe alongside the Company's boat "Peace River."



This photograph shows how the banks of Canada follow closely upon the entrance of civilization



Hudson's Bay Company's boat "Athabaska River" — which the opposition boat its about to pass after three hours' racing

Kind friends helped us unload. A cheery fire in the salon, a cup of tea, and welcoming smiles soon drove out the cold and stiffness accumulated since five in the morning. This was at the end of the telegraph line and the beginning of civilization which curiously enough was truly welcome.

Will the North pass as our West has passed? Even when the Peace River is settled as it soon will be, there will remain a vast fur-bearing region, but that the peculiar types of white people and Indians with their present customs and manners can long survive is a question, and they make the real North.



Water on top of solid sea ice in June

## "MY LIFE WITH THE ESKIMO"

REVIEW OF A RECENT BOOK<sup>1</sup> BY VILHJÁLMUR STEFÁNSSON, LEADER OF  
THE CANADIAN ARCTIC EXPEDITION

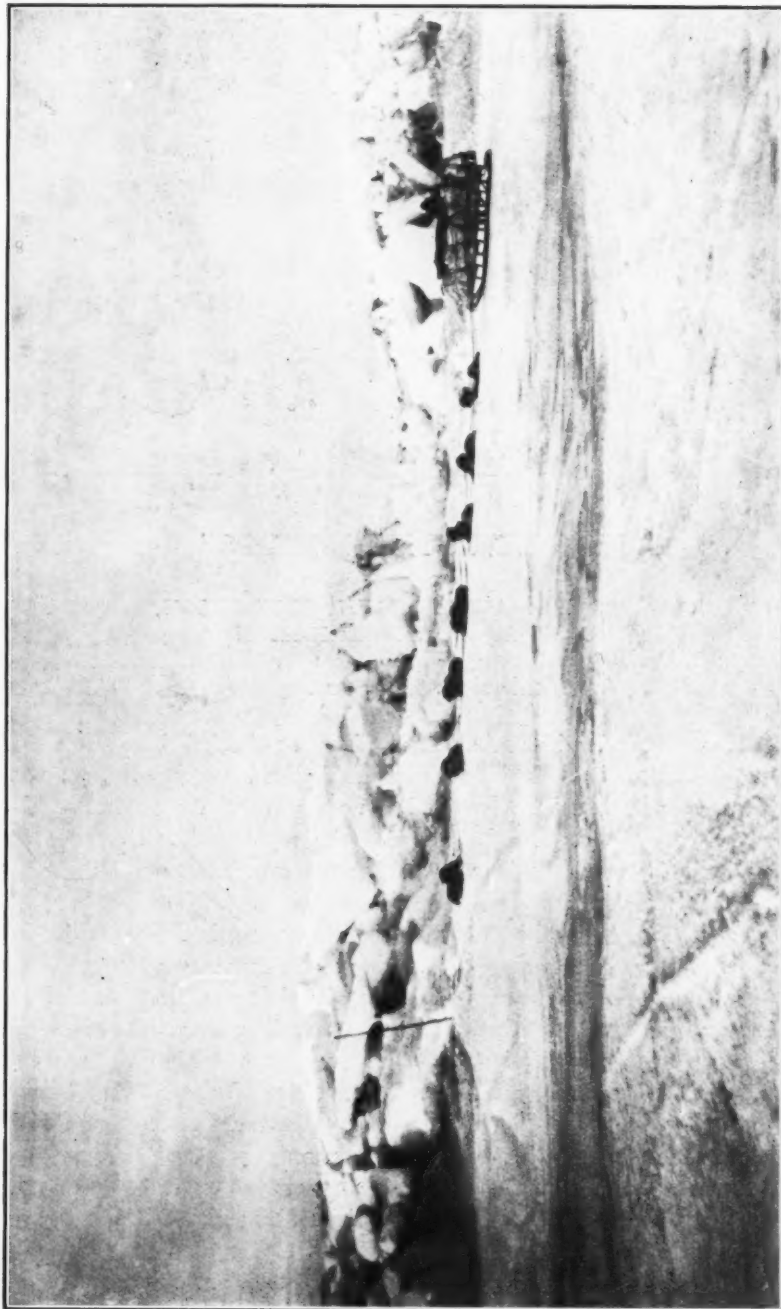
By Herbert L. Bridgman

RARELY if ever has the dramatic element colored and dominated expeditions, as it has Stefánsson's. "Blonde Eskimo," though only an incident and a comparatively minor one, of four years of hard, faithful work, caught the popular fancy the world over, and now after weary months of waiting the certainty that the "Karluk" carrying the northern party of the expedition, is lost and a third of her party missing, is succeeded by deeper and darker mystery as to the fate of the expedition's leader with his two companions. Those who have known Stefánsson longest and best do not give up hope, but the little party adrift in open Arctic pack must be in desperate chance either of gaining

Banks Land or of subsisting for any considerable time.

But no matter what may be the solution of the mystery haunting and enveloping the expedition of 1913, it but heightens and intensifies the interest with which one reads *My Life with the Eskimo*, a comely volume of compelling interest and that essential charm which personal, truth narratives, well told, always command. That Stefánsson's project to "live off the country," practically alone, was daring and original, as well as the core of practical common sense no one can now deny. Much of the success which he achieved was, however, due to him, rather than to his theory. A man less tenacious and resourceful, under circumstances exactly like those which confronted Stefánsson might have made total wreck of his undertaking and perished into the bargain. Contrast the

<sup>1</sup>MY LIFE WITH THE ESKIMO. Vilhjálmur Stefánsson. Svo., 538 pages. Illustrated with 60 halftone plates from photographs by the Author. New York: The Macmillan Company, 1913.



*From My Life with the Eskimo, through  
courtesy of the Macmillan Company*

**SEA ICE SHOWING HIGH PRESSURE RIDGE TO BE CROSSED**

The heavy bulky load of ethnological specimens for the Museum, made progress difficult, and very often the axe had to be used for road-making





*From My Life with the Eskimo, through  
courtesy of the Macmillan Company*

#### SEARCHING FOR ARCHAEOLOGICAL SPECIMENS AT CAPE SMYTHE

Excavations in the house ruins and kitchen middens yielded some 20,000 specimens (now among the valuable possessions of the Museum) which throw much new light on the life of the Eskimo in prehistoric times



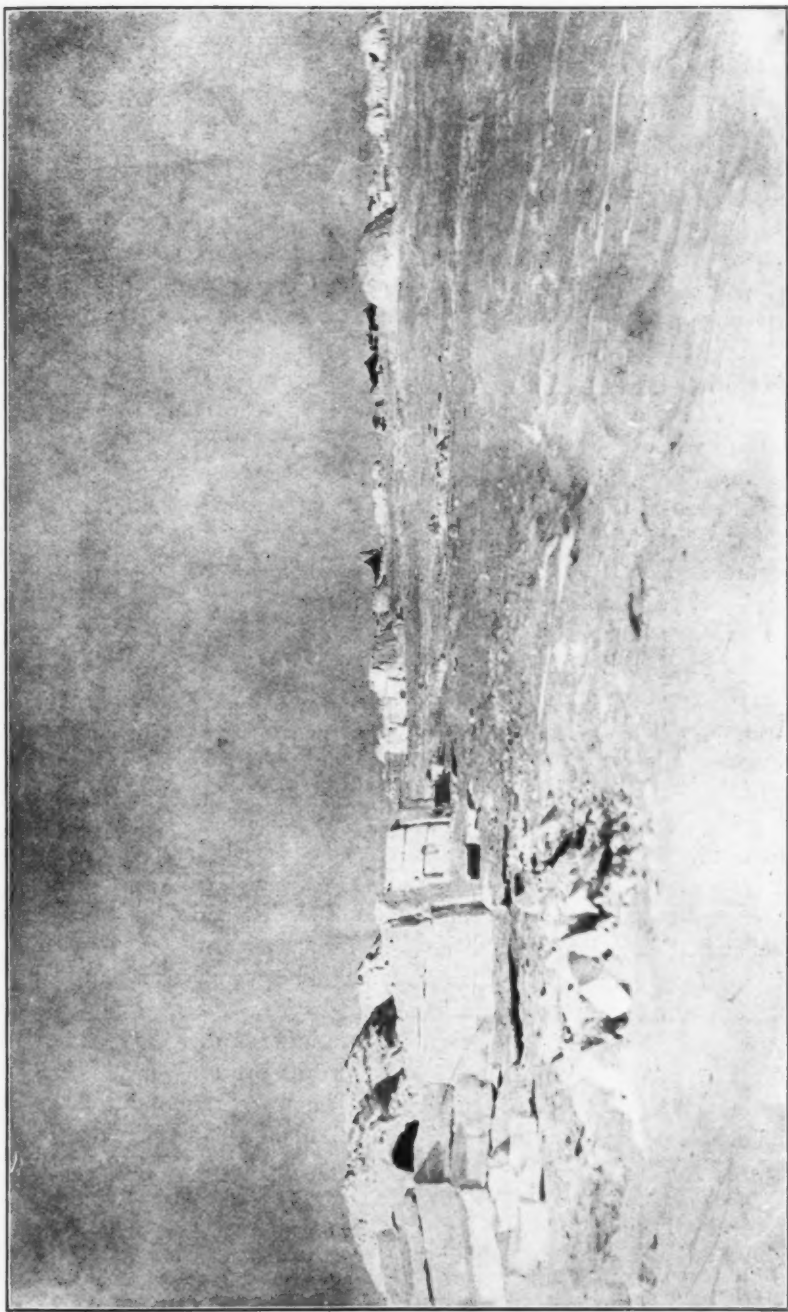
*From My Life with the Eskimo, through  
courtesy of the Macmillan Company*

#### PRINCE ALBERT SOUND GROUP OF ESKIMO

These and many other Victoria Island Eskimo suggest Europeans not only in blond characteristics which no full-blooded Eskimo should have but also in the form of the skull as proved by the many head measurements taken. It is suggested as a possibility that the "Blond Eskimo" may be descendants of the Scandinavian colonists of Greenland

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*From My Life with the Eskimo, through  
courtesy of the Macmillan Company*

#### ESKIMO VILLAGE OF TWENTY-SEVEN DESERTED AND THREE OCCUPIED HOUSES

This village of Copper Eskimo, and another ten miles away with its twenty-seven houses occupied by the one hundred and fifty Eskimo who had moved on from here, were approximately in the middle of Prince Albert Sound and were the largest villages belonging to a single tribe discovered. From the people (the Kanghirgyuarmiut) of these villages a complete collection of clothing, hunting implements and other ethnological specimens was purchased for the American Museum



single white hunter cutting loose from his base, burning his bridges behind him, striking out with only rifle, sledge and two Eskimo, into the unknown East, ignorant whether he should find the missing tribes he sought or the game on which life depended, with the same man commanding fifty men and a squadron of three ships under the Canadian flag, and one gets a sense of the difference in exploration methods and the different ways by which men go about what looks like pretty much the same thing.

More than these rare enough qualities though, Stefánsson, as the reader of *My Life with the Eskimo* will quickly learn, has others not less notable. He not only can make history, he tells it with frankness, simplicity and naïvete which make reading a pleasure and carry one, as with actors in a play or characters in romance. He makes light of hardships, hard places and hard luck and whether without matches or food, appears to count it as all in the game and never grumbles nor bewails his luck.

As a contribution of sub-Arctic ethnology and archaeology, although written in familiar terms for the reading of everybody, the book adds a store to knowledge, while when it comes to dealing with purely scientific and technical values, no authority is as competent and impartial as Stefánsson. He takes nothing for granted, not many things, even himself seriously, and weighs all theories and hypotheses in the light of actual facts and positive evidence. He does not attempt to decide where the blonde Es-

kimo came from. He tells what he saw and learned and reserves his decision until he is certain that he has gathered all the evidence.

In like manner the two chapters, supplemental to the narrative, upon the religion of the Eskimo and conversion of the heathen, are a most illuminating assemblage of actual facts, upon which Stefánsson ventures no dogmatic opinion, although it is easy to detect between the lines what he really thinks.

Dr. R. M. Anderson's hundred pages on the geology, plants, trees, fishes and mammals of the Northwestern Arctic are valuable and instructive, cut down to lowest and scientific terms, and his presence with his former leader and comrade with the Canadian Arctic expedition gives promise of thorough study and large accessions of knowledge concerning a rapidly disappearing fauna. Maps and indexes are hardly as complete and copious as would be desired and the haste of Stefánsson's departure to which the publishers refer, is emphasized by the lack of a table of contents and an introduction, for which the first chapter will serve as a tolerable substitute.

*My Life with the Eskimo* must make multitudes of readers and friends everywhere, who will await with eagerness the news, as it shall come at infrequent and irregular intervals, of the absent expedition, until it brings to us the chapters yet to be written concerning the distribution and the past, present and future of these quaint interesting Eskimo tribes of our common human family.

## SHELL COLLECTION IN THE AMERICAN MUSEUM

By L. P. Gratacap

PERHAPS no department of zoölogy exceeds conchology in appeal to the imagination and to the intellect.

Shells are among the earliest evidences of life upon our globe and their preservation in the older rocks surpasses in its intelligibility that of any other order of organisms, while in the world around us they inhabit the land and the sea with a universality of diffusion that is preëminent.

Their formal contrasts are also remarkable. Grouped to-day under Mollusca, the zoölogist contemplates an assemblage of animals which in their divergent aspects at either end of the series brings him in contact with the extraordinary calamaries, squids and cuttlefish and with the graceful, delicately colored and fragile nudibranchs. No systematic division of the kingdom of living things perhaps offers so apparently heterogeneous an association. Let the reader recall to mind those marine monsters of fabled ferocity such as the giant squids, creatures that may have attained a length of fifty feet, a great part of which belonged to their grotesque and powerful arms, then watch—if he is afforded the pleasure—the nereid-like beauty and protean coloration of *Dendronatus* as he may see it on rocky bottoms or in tide pools on the coast of Maine, and then bring together under one collocation these almost irreconcilable elements and he will realize the wonderful contents of this study; all the more too as in neither the squid nor in the sea-slugs is there any showing of a shell. It is indeed not possible to reserve astonishment when we find the bivalve (oyster, clam, mussel), united in the same class with the big whelks (*Strombus*), the colossal tritons and the variegated cowries (*Cypræa*) and also with those singular sluggish patches of many-plated elliptical bodies immovably adherent to rocks, which the fishermen call "coats-of-mail," and collectors call "chitons," and which the nomenclatural facility of systematists arranges under the descriptive designation of the Polyplacophora.

Turning to the land the student encounters an innumerable army of molluscan inhabitants which, excepting that they do not fly, fill it at all points, not omitting its lakes and

rivers and which take on in southern climes the most vivid colorations.

The interest of shells however is not at all limited to these contrasts of form or function or to their diversity of ornamentation. By reason of their distribution in time they allow the palæontologist to guide or correct the geologist, while almost more discernibly than any other kind of life, they mark the evolutionary stages of creation, and enable the student of past conditions to determine the geographical and climatic fluctuations of the continents. They notably contribute to the current discussions which engage naturalists as to centers of radiation, convergence, or parallelism of growth, survival, selection, migration, variation, rudimentary organs, environment, acceleration and heterostylism, and while they may lack what might be called a muscularity of demonstration, their evidence perhaps is more conclusive if more subtle, than that derived from the mammals or the birds or the reptiles.

The shell collection now opened to the public, after three years of seclusion, by no means illustrates all the claims made above. It is primarily a collection of living shells and the shadowy extension of the class backward to the first dawn of life is scarcely hinted at. Nor at present has it been made illustrative of the ecological problems which exercise so much fascination for investigators, problems of where and how and why. In the condition in which the visitor will find it, it is a fairly representative collection of marine, fresh-water and land shells, and only in the synoptical series on the south wall, is any intimation gleaned of the existence of molluscs which have no shell, such as the squids and nudibranchs. But the collection is not on that account deprived of interest or charm, indeed a too preponderant invasion of fossil shells would prove deterrent to the average visitor and the shell-less molluscs could only secure representation, as they do, in alcoholic specimens or by models.

The apportionment of parts in the hall is quickly explained. The flat table cases at the north and south ends contain land shells, with a representation of brackish water shells (*Cassidulus*, *Pythia*, *Melampus*) and a few

pond snails (*Limnea*, *Physa*, *Planorbis* etc.); the marine univalves are arranged in the large metallic cases in the east and west corridors, and the bivalves (Pelecypoda) occupy the rail cases, while a much contracted, and simply emblematic, synoptical series has been placed in the south wall cases, and especial exhibits, as of abnormalities, ornamental uses, large shells, color or other variation, and the map of molluscan oceanic provinces with representative genera, are installed on the north wall.

Even thus limited the prodigality of the display must prove educational, while in many genera the long suites and the perfection of the shells convey an æsthetic pleasure which many visitors may find helpful for retaining scientific names and position. A hall of shells broadly generalized and controlled by the wisest scientific spirit would make it tributary — let us say — to oceanography, where the populations of the successive benches of the sea margin and the inhabitants of the abyss would be exhibited, while it also defined, in its arrangement, land faunal areas. It is however certain that in such a disposition of the shell collection, systematic study would be much deranged, and so far as permanent impressions of the families and genera of shells are valuable, visitors might lose much. A double exhibition might be so conceived that both the distribution and the kinds of shells in their serial and group arrangements could be harmonized with reciprocal benefits in both divisions from the collocation.

The collection as made up, is a composite one, and encloses, by inference and suggestion as well as by chronological data, an interesting history of early conchological effort. Its nucleus — although like most nuclei overwhelmingly occluded in subsequent growths — was the famous collection of Dr. John C. Jay, and its presentation by Miss Catherine Wolf to the American Museum laid the foundations of the great scientific library now found within its walls. It was practically a purchase of the large Jay library, which brought the Jay collection of shells along with it, that began the present library of the Museum.

The Jay collection of shells is inseparable of course from the stirring memories of the excitement, interest and applause that attended the publication of the Jay catalogue of shells, near the middle of the last century. It was a remarkable work in its

day. It remains a monument to the author's industry. Bibliographic research had hardly in this country covered so large a field before. The work went through four editions and enumerated nearly eleven thousand species, the compilation of its synonymy embracing some 40,000 names. Collecting in those days, as is very well known, did not resume, as to-day, the details of occurrence, and locality data are often vague or illimitable, but the collection was a very notable one and probably in its comprehension of families exceeded in importance any public or private collection at the time.

To this collection has been added, by purchase, the very remarkably beautiful collection of William S. Haines which added not only a long list of species, but increased the individual suites by many notably perfect specimens. The Bickmore collections from the East Indies and Spice Islands, the John Crooke collection — a very valuable gift from that gentleman — and the Binney and Bland collection of land shells, with many types and cotypes, together with numerous gifts of smaller lots, none negligible and many important, make up the Museum's present collection.

A late and very important addition of specimens was received from the late Frederick A. Constable, presented before his death. It particularly embraces a really notable assemblage of small shells labelled and many most painstakingly mounted in glass-covered black-edged boxes. The scientific importance of this generous gift cannot be overestimated.

The immediate work to be undertaken in connection with this collection seems rather startling in its demands. The collection must be relabelled in large measure with deference to new or later nomenclatural needs and in some way a systematic study collection must be segregated for daily use. Its gaps should be filled, and especially the molluscan fauna of America — no matter how inclusive or exclusive the term is made — be fully illustrated, while the excursus of more ambitious designs might reasonably extend all of this work into a developmental comparative study of Tertiary and living forms. But obviously, apart from these higher scientific ends, the immediate requisition is an attractive installment, and freshened accessories, whereby the young student, the collector and the more or less observant visitor may be aided, stimulated or instructed.

## MUSEUM NOTES

WORD has been received from Messrs. Herbert Lang and James Chapin of the Congo expedition that they arrived safely at Stanleyville on September 30. The collections are in fine condition and in such quantity that the final packing will demand three months. It will be remembered that the expedition set sail more than five years ago under the patronage of the Belgian government and was financed by Messrs. John B. Trevor, Charles Lanier, Cleveland H. Dodge, J. P. Morgan, William K. Vanderbilt, A. D. Juilliard, Robert W. Golet and William Rockefeller as well as by an appropriation from the Belgian Government. The aims and scope of the expedition and the work accomplished rank it among the greatest that the Museum has ever sent out.

MR. LEO E. MILLER was chosen to lead another expedition to South America and set out during the latter part of October. Mr. Miller has already done valuable scientific work as a member of the Museum's first Colombian expedition in 1911, leader of the second Colombian expedition in 1911 and 1912, leader of the Upper Orinoco expedition in 1913, leader of the British Guiana expedition in 1913 and mammalogist of Colonel Roosevelt's South American expedition in 1913 and 1914, and is thus particularly well equipped for work on that continent. Mr. Miller will have as his assistant, Mr. Howarth Boyle. The expedition is financed in part by Colonel Roosevelt and in fact has come about as an outgrowth of friendly relations which grew up between Mr. Miller and Colonel Roosevelt on the recent South American expedition. The new expedition will proceed directly to Colombia and will go first to the semi-arid region around Barranquilla, then up the Magdalena to Puerto Berrio and across to Medellín, the capital of Antioquia. With Medellín as a base about four months will probably be spent in this region, working out the different life zones from the low tropical forest at Cáceres on the Cauca to the cold paramo of St. Elena. The expedition will then take up work on the west coast of Panama for a few months, will go from there to Chili, and thence overland into the highlands of Bolivia, making Sucre the base of operations. Some months will be spent in this

neighborhood, with possibly a trip to Lake Titicaca. The return will very likely be made by way of the Rio Beni, the Madeira and the Amazon rivers some two years hence.

MR. ALBERT THOMSON continued work in the agate fossil quarry in Nebraska this summer for the department of vertebrate palaeontology. Four skeletons of the great "clawed ungulate" *Moropus* were obtained, which, added to those secured during the last two seasons, will supply a series of specimens such as is seldom available for the study of any extinct mammal. The best of these skeletons will be selected for a mounted group to be placed in the Tertiary mammal hall.

The principal expedition of this department was in charge of Mr. Barnum Brown, to the Cretaceous dinosaur bed of Alberta. The results of this highly successful season's work will be reported in a later number of the JOURNAL.

A PLAN for the extension of the educational work of the Museum, providing for the establishment of local lecture centers in centrally located schools, the inauguration of a system for loaning slides and the opening of a branch teaching and exhibition museum in the Washington Irving High School, has been presented to the Board of Trustees and has received their general approval. President Osborn has appointed a committee consisting of Mr. Felix M. Warburg and Mr. R. Fulton Cutting of the trustees and Mr. George H. Sherwood and Dr. C.-E. A. Winslow of the Museum faculty to consider further the detailed plans for the proposed extension. This project has also received the endorsement of Mr. Thomas W. Churchill, president of the Board of Education of New York City, who has appointed a special committee of the board consisting of Mr. Frank D. Wilsey, chairman, Dr. Ira S. Wile and Mr. Francis P. Cunnion to consider these plans for coöperation between the Board of Education and the Museum. The plans have been approved also by Dr. William H. Maxwell, city superintendent of schools.

DR. ROBERT H. LOWIE spent the summer in ethnological work in Montana and Nevada. He visited the Crow Indians of southeastern Montana from whom he secured a large body

of mythological tales. From the Northern Paiute whom he visited for the first time as a part of the department of anthropology's reconnaissance of the plateau area, he obtained a representative collection of basketry and other objects representative of native culture. One of the most interesting specimens is a boat or *balsa*, more than ten feet in length and made entirely of rushes, for use during the fall duck hunt. A brief visit was paid to the Ute Indians of Utah for the purpose of comparison with the southern Ute of southwestern Colorado, who had been visited some years ago.

SINCE the last issue of the JOURNAL the following persons have become members of the Museum:

*Patron*, MR. ROBERT FULTON CUTTING;

*Life Members*, MRS. SIDNEY M. COLGATE, Dr. W. S. RAINSFORD, and MESSRS. JAMES BARNES, SAMUEL J. BLOOMINGDALE, S. BAYARD COLGATE, EDWARD D. HARRIS, FREDERICK C. ROWLEY and HENRY ROWLEY;

*Annual Members*, MRS. JOHN A. MORRIS, MISS R. C. BOARDMAN, Dr. LEE M. HURD, and MESSRS. DAVID A. ARONSON, H. E. FENSKE, FRED W. GREEN, ROBERT W. MARTIN, CLYDE MILNE, JAMES ULMANN, and OTTO VON SCHRENK.

OWING to a depletion of funds available for publication of the JOURNAL, the Museum has considered it advisable to combine the October and November numbers in the present issue, to be followed by the December number as usual.

A LETTER recently addressed by President Henry Fairfield Osborn of the American Museum to the President of the Chinese Republic urging that the Chinese Republic preserve its antiquities and products of art, was reprinted by order of the President of the Chinese Republic in a large number of the newspapers of China. This letter and the memorial received from the Asiatic Institute was followed by an edict protecting all monuments of China and finally by an edict from the Chinese President setting aside a large reservation and buildings in the city of Peking for the establishment of a national historical and art museum.

A preliminary report is now in press, of the work of the Stefánsson-Anderson expedition, which spent 1909-12 in ethnological

and zoölogical research for the Museum along the shores of Beaufort Sea and Coronation Gulf in the Arctic. The report was in part prepared by Mr. Stefánsson before his departure on the Canadian Arctic expedition in the summer of 1913 and consists further of extracts taken directly from his field journals. It is made up of 376 pages, with two maps and 94 figures in the text, and will appear in the *Anthropological Papers* published by the Museum.

Dr. BRUNO ETTKEKING, who has been assisting in compiling the results of the Jesup North Pacific expedition as regards physical anthropology, has returned from Germany where he has been spending the summer.

THE Museum has recently been honored by a visit from Messrs. R. R. Marett and Sydney Hartland, two eminent English anthropologists who were returning from the meetings of the British Association for the Advancement of Science held in Australia during the summer.

Dr. PLINY E. GODDARD spent August and September in ethnological work among the Apache Indians along the Gila and San Carlos rivers in Arizona, and succeeded in securing valuable motion picture films illustrating the industries of the people.

DURING the past summer Dr. Clark Wissler, with the aid of Mr. James R. Murie, an educated and influential member of the Pawnee tribe of Indians, completed various manuscripts descriptive of the societies of the Pawnee.

THE Danish Arctic explorer, Mr. Knud Rasmussen, who showed marked courtesy to the members of the Crocker Land expedition during the past year, has recently had \$75,000 placed at his disposal for the purpose of outfitting a North Pole expedition. The expedition, which will take provisions for two years, will be provided with all modern appliances and will be accompanied by a staff of scientists. The base will be at Cape York, in Greenland.

A LETTER has been received by the Museum from Mr. D. B. Boggild, director of the Mineralogical Museum of the University of Copenhagen, expressing appreciation for the assistance rendered by the members of the Crocker Land party to Mr. Knud Rasmussen.



THE Transantarctic expedition headed by Sir Ernest Shackleton, who was a frequent visitor at the Museum during the outfitting of Mr. Stefánsson's Arctic expedition, left London in September. One section under Sir Ernest Shackleton departed for South America and the other half of the expedition left for Ross Sea on the New Zealand side of the Antarctic, by way of Tasmania. The Ross Sea party will board the exploration ship "Aurora" at Hobart, Tasmania. Sir Ernest Shackleton will leave Buenos Aires by the ship "Endurance." It is expected that the two sections of the expedition will meet by April of next year or failing that, by March, 1916.

MR. H. R. FRANCIS, assistant professor of landscape engineering in the New York State College of Forestry at Syracuse University, made a street tree survey of a section of the Borough of Manhattan during the summer, with an office in the Museum as his headquarters. The work was undertaken by the College of Forestry in coöperation with the Tree Planting Association of New York City. During the winter of 1913-14 a general survey was made of all the Borough of Manhattan and a report was issued by Professor Francis to the Tree Planting Association. The work this summer was to ascertain the conditions in detail of a section of Manhattan that would be typical of the Borough. The survey was made in the portion of Manhattan east of Fifth Avenue between 86th Street and 42nd, east of Sixth Avenue between 40th Street and 14th Street and east of Avenue B between 14th Street and Rivington Street. A large amount of valuable data was obtained which will be used as a basis for an additional report to the Tree Planting Association.

Professor Francis found that there is great need for more intelligent care in the planting and preservation of trees along the streets of Greater New York City. The Park Department under whose supervision the work of this kind has been done since 1902, has never had funds sufficient to care for trees already planted or those planted from time to time by private property owners, nor to plant new trees along streets where trees have died. In the section of the city surveyed by Professor Francis it was found that the trees were dying through lack of care, and opportunities for planting trees had been

neglected for many years. This is particularly true of the section east of Third Avenue where thousands of children have no place to play other than on the streets. What New York City really needs is a Bureau of Tree Culture with a city forester for each borough and the proper support from the city to do the work of planting and preservation of shade trees in an effective way.

DR. FREDERICK W. TRUE, assistant director of the Smithsonian Institution and one of the foremost cetologists of the present time, died in Washington on June 25.

THE American Ornithologists' Union has appointed Dr. J. A. Allen and Dr. Frank M. Chapman of the department of mammalogy and ornithology, with ten other scientists as a committee on classification and nomenclature of North American birds.

DURING the summer a visit was paid to the Museum by Dr. Alexander G. Ruthven and Mr. Frederick M. Gaige, of the Museum of Zoölogy of the University of Michigan, en route to British Guiana, where they will carry on zoölogical field studies.

DR. C.-E. A. WINSLOW has resigned from the College of the City of New York to become director of education in the reorganized State Department of Health. His work at the Museum will continue as heretofore.

DR. HERBERT J. SPINDEN of the department of anthropology returned during the summer from a seven months' archaeological expedition to the Maya ruins of Central America. Dr. Spinden was accompanied by Mr. S. G. Morley, at the time a fellow of the Archaeological Institute of America and now connected with the Carnegie Institution of Washington. Together they visited the principal ruins of southern Yucatan including Naranjo, Tikal, Ixkun, Seibal, Yaxchilan and Piedras Negras and obtained valuable information concerning monuments already known and found others not previously reported. Field work was also carried on among the Carib Indians of British Honduras. A reconnaissance of the interesting archaeology of Salvador was also accomplished. A number of collections were secured in different localities, the largest and most important being from Salvador.

MR. ALANSON SKINNER of the department of anthropology spent the early part of the summer with the Kansa Indians in northern Oklahoma where data on their social life and societies was obtained, and the last sacred war bundle in the possession of the tribe secured. From that point Mr. Skinner went to central Oklahoma where work was taken up among the Iowa. Special attention was paid to the military and secret societies of the tribe and a complete ritual of the medicine dance was secured, as well as several specimens of different sacred bundles. A few days were spent among the Ponca where further data was collected upon the societies of that tribe. The latter part of the summer Mr. Skinner stayed at Sisseton, South Dakota, where with the assistance of Mr. Amos One Road, a young Sioux, investigations were made among the Eastern Dakota with special regard to material culture. These people, unlike the Oklahoma tribes, have given up almost everything that pertained to the old Indian life and are now actively engaged in farming. Some very old and unusual specimens were obtained however from people who had kept them as relics of the past.

DURING July, August and the greater portion of September Dr. Chester A. Reeds of the department of geology and invertebrate palaeontology together with Messrs. Hyde, Logan and Snider of the Oklahoma Geological Survey, as field assistants, made a collection of approximately 50,000 invertebrate fossils from the Hunton beds, Arbuckle Mountains, Oklahoma. Nine distinct geological horizons were established, five being Silurian, and four Lower Devonian. The collection sent to the Museum consists of small specimens, except for two well-preserved sections of a fossil tree (*Dadoxylon newberryensis*). The specimens of fossil wood have been placed on exhibition in the hall of geology.

THE Schrammen collection of Cretaceous fossils has been purchased by the department of geology and invertebrate palaeontology of the Museum from Dr. A. Schrammen of Hildesheim, Germany. It consists of eleven hundred species of invertebrates represented by four thousand specimens which were collected from some fifty localities and fourteen geological horizons in the upper and lower Cretaceous beds of northwest Germany. The phyla and sub-phyla represented are the Foraminifera, spongia, hydrozoa, anthozoa,

echinoidea, annelida, brachiopoda, gastropoda, pelecypoda and cephalopoda. Among the pelecypoda and cephalopoda are to be found the type specimens of Wolleman in his work on the Cretaceous of Misburg and Nettlingen. The most valuable portion of the collection is the large number of types of siliceous sponges from the Mucronaten and Quadraten Senonian strata. Those from Oberg are really beautiful, and although delicate, are remarkably well preserved. The descriptions of the type sponges appear in Dr. A. Schrammen's monograph on the *Kreidespongien*, *Palaeontographica*, Vol. V, Supplement.

MISS ANN E. THOMAS has been appointed assistant in the department of public education to fill the vacancy caused by the resignation of Mrs. Agnes Laidlaw Vaughan.

MR. ADOLPH ELWYN, who for the past nine years has been assistant in the department of anatomy and physiology, has resigned his position to become instructor in histology and biology at the Long Island College Hospital. Mr. Clarence R. Halter has been appointed to succeed Mr. Elwyn.

MR. F. E. WATSON has been appointed an assistant in the department of invertebrate zoölogy. He will devote the greater portion of his time to Lepidoptera.

DR. SIMOENS DA SILVA of Rio de Janeiro visited the Museum during October, having come to the United States as the official Brazilian delegate to the Congress of Americanists. Dr. Da Silva is interested in archæology and has a private museum devoted to that branch of science.

IN the will of the late Miss Dessie Greer, an annual member of the Museum, the Museum is designated as a beneficiary of a fund of \$90,000, which is being held in trust during the lifetime of Miss Theresa Trimper.

UNDER the will of the late Morris Loeb the Museum is designated as one of the beneficiaries of the residuary estate, appraised at \$989,857, subject to a life interest of Mrs. Loeb. The appraiser estimates that the Museum's share of this fund will be \$36,946. The Museum is also a contingent beneficiary of a special fund of \$25,000 to be used for the establishment or maintenance of a chemical type museum.

## MUSEUM NOTES (CONTINUED)

THE American Fisheries Society held its forty-fourth annual meeting in Washington, D. C., from September 30 to October 3, at the new National Museum building. The program included papers on aquatic biology, parasites and diseases of fishes, utilization of fisheries products, fish culture and commercial fisheries. Mr. John T. Nichols of the Museum's department of ichthyology and herpetology was in attendance.

THE meeting of the International Congress of Americanists, which is held biennially and meets in America every fourth year and which was to have taken place in Washington in October, has been indefinitely postponed because of the war in Europe.

ON September 7 the National Association of German-American Technologists held a scientific meeting in the lecture hall of the Museum, where papers were read by Dr. Stahl of Pittsburgh on "New Uses for Hydrofluoric Acid" and by Dr. F. von Efele on "Primitive Tools and Appliances of the Aboriginal Americans before the Arrival of Columbus." In connection with the lectures the mineral collection and the Indian halls were visited.

A HOST of fishes of every imaginable shape and color, the largest scarcely five inches in length, competed for honors at the Fifth Annual Public Exhibition of the Aquarium Society, held at the American Museum from October 15 to 18. Fishes from the water-troughs of India, fish-ponds of the Orient, tepid swamps of South America and tributaries of the Congo were there, with small wild species from temperate zones and the indolent domestic goldfish. Perhaps the most interesting fish shown this year was a Gymnotid eel from South America, doubtless the first living example of this group that has ever been publicly shown.

THE following lectures have been arranged in the Members' course: November 12, "From Coast to Coast Through Central Africa," MR. JAMES BARNES; November 19, "Nomadic Indians of the Southwest," DR. PLINY E. GODDARD; December 3, "Beautiful Japan," MR. ROY C. ANDREWS; December 10, "The Fauna of Western Brazil," COL. THEODORE ROOSEVELT.

STORIES for the children of Members will begin on Saturday morning, November 7, with a talk by DR. WILLIAM L. FINLEY on "Our Children and the Birds." DR. FREDERIC A. LUCAS will tell of "Monsters of the Past" on November 14 and this will be followed by an illustrated story of "Hiawatha" by MR. ROBERT S. PIGGOTT on November 21st. The concluding story, "Wild Animals at Home," will be given on November 28 by MR. ERNEST THOMPSON SETON.

THE following lectures, illustrated by stereopticon and motion pictures, have been arranged in the Children's Course: October 19, "Forest Trees and Their Uses," MR. GEORGE H. SHERWOOD; October 21, "The Panama Canal," DR. G. CLYDE FISHER; October 22, "Baby Birds and Their Ways," DR. G. CLYDE FISHER; October 23, "Hiawatha's People," MR. ALANSON SKINNER; October 26, "The Sources of Our Food Supply," DR. G. CLYDE FISHER; October 28, "Our South American Neighbors," MR. CHARLES H. ROGERS; October 29, "Friends and Foes in Furs," MR. H. E. ANTHONY; October 30, "Early Explorers of North America," MISS ANN E. THOMAS; November 2, "The Rocky Mountain Region and its Products," MR. ALBERT E. BUTLER; November 4, "The War Zone of Western Europe," MISS ANN E. THOMAS; November 5, "A Plea for the Wild Flowers," MR. CHARLES F. MILLSAUGH; November 6, "Pioneers of the West," DR. G. CLYDE FISHER; November 9, "The City's Fire Department," MR. FRED H. SMYTH; November 11, "The Far East," DR. G. CLYDE FISHER; November 12, "Fur Seals at Home," MR. ROY C. ANDREWS; November 13, "New York City Before the Revolution," MR. ROY W. MINER; November 16, "Important Industries of New York State," MISS ANN E. THOMAS; November 18, "Mexico and Her People," MR. CHARLES H. ROGERS; November 19, "Water Babies," MR. ROY W. MINER; November 20, "Colonial and Revolutionary Days in New England," MISS ANN E. THOMAS; November 23, "Wonderful Work of Water," MR. GEORGE H. SHERWOOD; December 2, "African Desert and Jungle," DR. G. CLYDE FISHER; December 4, "The Growth of New York City," MR. ROY W. MINER.



Tree planting on state lands in New York

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